THE

JOURNAL OF GAS LIGHTING,

WATER SUPPLY, & SANITARY IMPROVEMENT.

[REGISTERED AS A NEWSPAPER.]

VOL. XXIX. No. 722.] LONDON, MARCH 13, 1877. [29TH YEAR.] Price 6d.

RAMSAY'S NEWCASTLE CANNEL COAL. Analysis—12,000 cubic feet of gas per ton of coal; 28-candle gas; coke, 66·70 per cent.; volatile matters, 33·30 per cent. Coke of good quality.

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The covering powers are considerably greater than those of any other Paint.—*See "Engineer," Nov.* 2, 1866.

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J. C. and Co. have been for many years the most extensive Manufacturers of Fire-Clay Retorts and Fire-Bricks in the Kingdom. Orders for Fire-Clay Retorts of all shapes and dimensions, and to fit any shaped Mouthpiece, Fire-Bricks, and every other article in Fire-Clay, are promptly executed at their Works as above.

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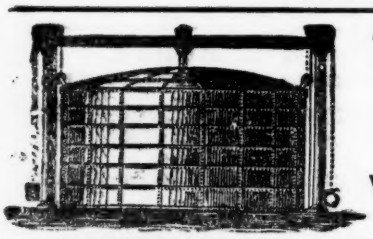
Now ready, GAS CHANDELIER BOOK (Reduced Prices), 7s. 6d.



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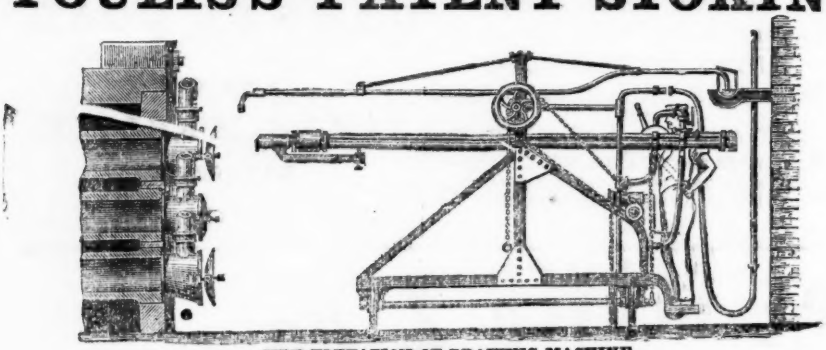
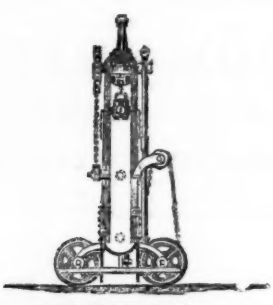


SIDE ELEVATION OF DRAWING MACHINE.



END ELEVATION.

(The Charging Machine will be Illustrated in next week's Advertisement.)

Makers: TANGYE BROTHERS and HOLMAN, London and Birmingham; ADAM WOODWARD and SON, Manchester; ROBERT LAIDLAW and SON, Glasgow; MASCHINENBAU-ACTIEN-GESELLSCHAFT HUMBOLDT, Kalk bei Deutz;
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SPECIAL NOTICE.—Our Patent Machine-made Retorts have now been in *actual work* nearly 800 days, and are yet in good order. References on application.

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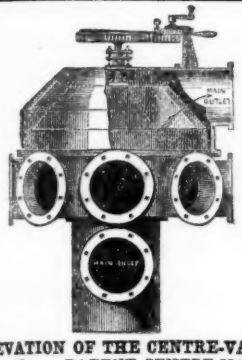
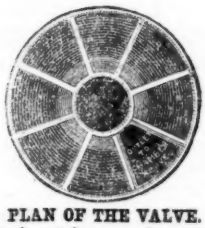
C. & W. WALKERS'

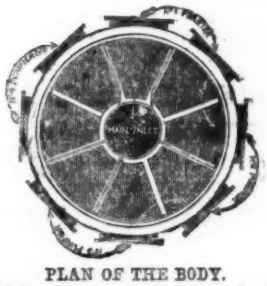
PATENT CENTRE-VALVES.



ELEVATION OF THE CENTRE-VALVE.



PLAN OF THE VALVE.



PLAN OF THE BODY.

These PATENT CENTRE-VALVES are the most perfect and certain means for working Purifiers on the system of three in action, and one out of action. The Valve itself is protected from all injury inside the safety cover. The working of the Valve is so easy, and so governed by the stop-catch movement, that the Purifiers can be instantaneously changed in the dark as well as in daylight. They are scraped perfectly true, metal to metal, the facings heretofore exposed are always covered, and there is nothing more reliable, certain, and durable in a gas-works. By their use the floor of the Purifying-house is clear and level; the Valve and all connexions being beneath the floor, out of the way of working. A considerable improvement and saving is effected in the cost of the connecting-pipes.

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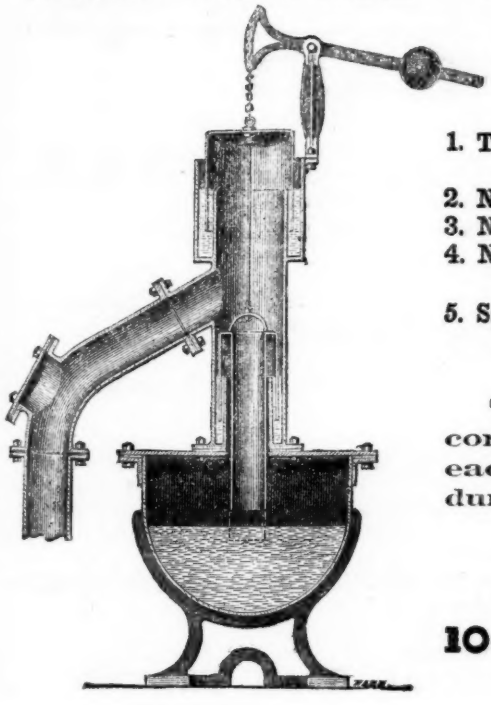
SELF-ACTING REMOVABLE DIP-PIPE,

PATENTED BY

CHANDLER & STEVENSON.



ADVANTAGES.

1. There is no pressure on the Retorts.
2. No deposit of Carbon.
3. No scurfing is required.
4. Never a choked Ascension-Pipe.
5. Saves Fuel and Wear and Tear.
6. Gets 10 per cent. more Gas out of the Coal, and a higher Illuminating Power.
7. Is never out of order.
8. Requires no attention.
9. Is perfectly automatic in its action.

These Dip-Pipes can now be supplied complete, except the flanched bend, for £4 each, which includes the charge for licence during the whole term of the patent.

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Who fix the Dip-Pipes, at a small Charge, when required.

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REGULATORS FOR THE AVERAGE METER SYSTEM.

Attention is called to their Dry Meters in Wood Cases, as used by the principal London Gas Companies. These Meters are especially suitable for seaport towns and for export.

The Company repair or convert every description of Wet Gas-Meters to De Castro and Burton's Patent.

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OF THE

FRICTIONLESS DRY GAS-METERS,

Beg to intimate to Gas Companies and others that they are now prepared to supply these very superior Meters at the same prices as for the ordinary Gas-Meters.

In the construction of this Meter, for which the best tin plates only are used, every mechanical contrivance has been taken advantage of successfully to reduce the friction to a minimum, which is amply proved by the fact that they are made to work upon only one-fortieth of an inch pressure. By an improvement also in their construction, a steadier light is obtained, and greater capacity than can be got from any other Meter in the market. No gas can pass under the valves on any back pressure, as is the case with many other Dry Meters.

To Gas Companies supplying gas through streets with heavy gradients, these Meters are invaluable, as much gas is saved from the low pressure required to work them.

ALL METERS ARE UPHELD FOR FIVE YEARS.

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NEW GAS-WORKS erected complete. Plans and Estimates furnished. MAINS, METERS, SERVICES, LAMPS, &c., adapted for Towns of any size. Gas Companies advised on Improvements, Extensions, and Alterations of Works.

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They beg special attention to the excellence and superiority of their WET and DRY METERS, several thousand being now in use by many of the largest Gas Companies in the West of England and South Wales. Warranted to measure correctly, and not to vary. Their acknowledged superiority has brought them into general use more rapidly than any Meters hitherto manufactured. A guarantee of Five years tendered with each Meter.

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And every Description of Gas Apparatus.

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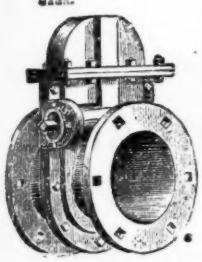
IMPROVED GAS-VALVES

WITH WROUGHT-IRON PINIONS.

List of prices, with full dimensions of all sizes up to 48-inch, to be had on application.

These Valves are proved on both sides to 30 lbs. on the square inch before leaving the works, and are kept in stock.



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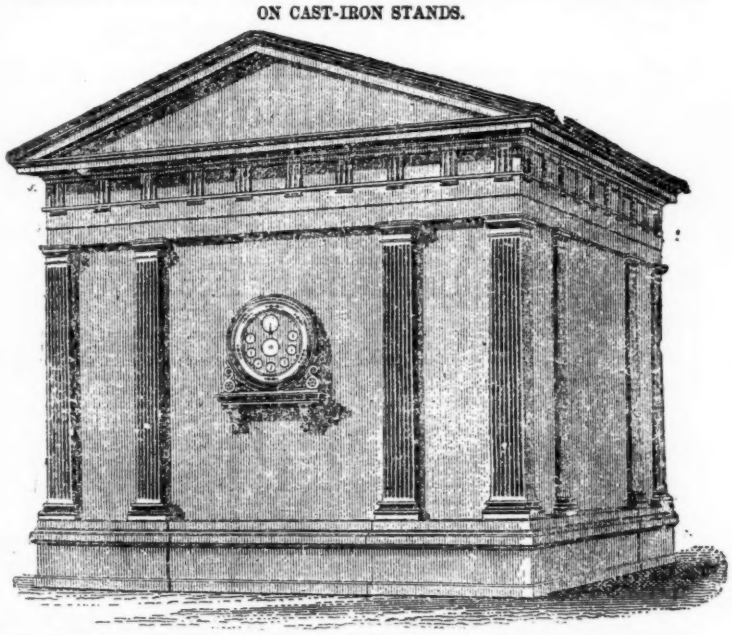

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Home and Foreign Orders promptly attended to.

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MADE BY MACHINERY

CAPABLE OF MAKING 10,000 PER WEEKLY.

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The NEW PATTERN

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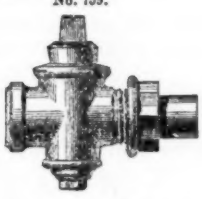
CAST-IRON GAS-MAIN COCKS,

WITH PATENT WHITE METAL PLUGS.

TRADE (L) MARK.

No. 758. No. 759.



The bodies of these Taps are made of iron, black or galvanized, and the plugs of patent metal. They are warranted not to set fast or corrode, as do Iron or Brass Cocks; will always work easily; are strong, well made, durable; of little or no intrinsic value, and therefore not likely to be stolen; and the prices as stated below are (especially upon the larger sizes) fully 50 per cent. less than Brass Cocks.

	½	¾	1	1¼	1½	2-inch.
No. 758, with inside screws for iron pipe, black	2/0	3/0	4/4	6/6	7/6	12/0 each.
No. 759, with union on one end screwed inside for iron pipe, black	2/9	3/10	5/4	8/0	9/0	15/6 each.
Nos. 758 and 759, galvanized	0/3	0/4	0/6	0/8	0/10	1/4 extra.

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CATHELS & TERRACE'S Patent Four-WAY DISC GAS-VALVE is the simplest and best Valve for Purifiers, and as a By-pass for other apparatus in Gas-Works. It is always gas-tight, and has no springs, ground faces, or other delicate parts. By its use the flow of the gas cannot be accidentally stopped, and it never sticks.

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RETORT-SETTINGS.

GUARANTEED TO HEAT UNIFORMLY WITH THE MINIMUM OF FUEL.

Coloured Lithograph copies of Working Drawings of Beds of 1, 2, 3, 5, 6, and 7 Retorts each, so clearly arranged and fully shown as to be easily understood by any retort-setter or bricklayer, having just been made of these valuable Settings, they can now be supplied with detailed specifications, immediately on receipt of orders.

Applications to be made to Mr. THOS. NEWBIGGING, Gas and Consulting Engineer, 5, Norfolk Street, MANCHESTER.

JAMES OAKES & CO.,

ALFRETON IRON-WORKS, DERBYSHIRE,

AND

WENLOCK IRON WHARF, 21 & 22, WHARF ROAD, CITY ROAD, LONDON, N.,

Keep in London and at their works large stocks of PIPES and CONNEXIONS (1½ to 36 inches in diameter); also make and supply Retorts, Tanks, Columns, Girders, Special Castings required by Gas, Water, Railway, Telegraph, Chemical, Colliery, and other Companies.

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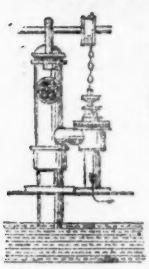

Produces from 10 to 20 per cent. more gas of higher illuminating power.

Prevents the deposit of carbon.

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This simple invention has been in use in many works for the last six months, with the above results.

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STEEL OF ALL DESCRIPTIONS,

SCREW STOCKS, TAPS, AND DIES, SPANNERS, RATCHET BRACES, LIFTING-JACKS, ANVILS, VICES,

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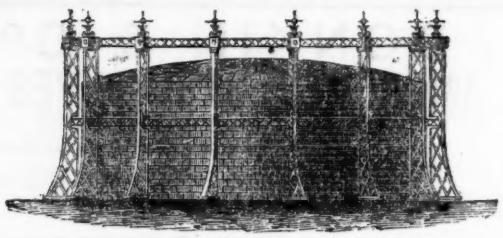

THE HORSELEY COMPANY,

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GAS ENGINEERS, IRONFOUNDERS, &c.,

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GASHOLDERS, WROUGHT AND CAST IRON TANKS, CONDENSERS, PURIFIERS, SCRUBBERS, MAINS, RETORT-LIDS, PLAIN AND DISHED, LAMP-POSTS, PIPES,

AND ALL REQUISITES FOR EITHER

GAS OR WATER WORKS;

ALSO

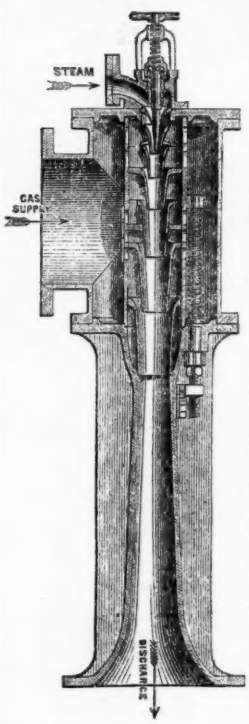
MAKERS OF ROOFS, BRIDGES, &c.

KÖRTING BROS.,

Steam-Jet Engineers,

7 and 17, LANCASTER AVENUE, MANCHESTER,

AND 40, LOWER GARDINER STREET, DUBLIN.



E. KÖRTING'S PATENT

STEAM-JET GAS-EXHAUSTER.

IMPROVED CLELAND'S PATENT.

Small Cost—Compactness—Perfectly Self-Acting—Self-Regulating—Self-Cleansing—No Steam-Engine—No Attention—No Extra Room Required—No Wear and Tear—No Noise—No Oscillation in Vacuum, or Back Pressure.

UPWARDS OF 200 IN USE.

SUPPLIED TO—

Chartered Gas Co.	Glasgow Corporation.	Hanna, Donald, and Wilson, London.
London Gas Co.	Leyland Gas Co.	Ratcliff Gas-Works.
S. Metropolitan Gas Co.	Stalybridge Gas-Works.	Kendal Gas-Works.
Phœnix Gas Co.	Lincoln Gas-Works.	Longton Gas Co.
Liverpool Gas Co.	Birmingham Gas-Works.	Dartford Gas Co.
Bolton Corporation.	Wakefield Gas-Works.	Exeter Gas Co.
Horsham Gas Co.	Brentford Gas-Works.	Harrogate Gas Co.
Epsom and Ewell Gas Co.	Burnley Gas-Works.	Hertford Gas Co.
Ipswich Gas Co.	Guildford Gas-Works.	Waterside Gas-Works, Todmorden.
Cheltenham Gas Co.	Gloucester Gas-Works.	F. W. Grafton and Co., Accrington.
Sandwich Gas Co.	Kirkintilloch Gas-Wks.	
Cornholme Dis. Gas-Wks.	Nantwich Gas-Works.	
Bury Gas-Works.	Enniskillen Gas-Works.	
	&c., &c., &c.	

E. KÖRTING'S PATENT STEAM-JET REVIVIFYING BLOWERS FOR THE PURIFYING MATERIAL.

SOLE LICENSEES FOR

W. CLELAND'S PATENT STEAM SCRUBBER AND SLOW-SPEED CONDENSER.

FOR PARTICULARS, APPLY TO

KÖRTING BROS., 7 and 17, Lancaster Avenue, MANCHESTER,

and 40, Lower Gardiner Street, Dublin,

OR TO

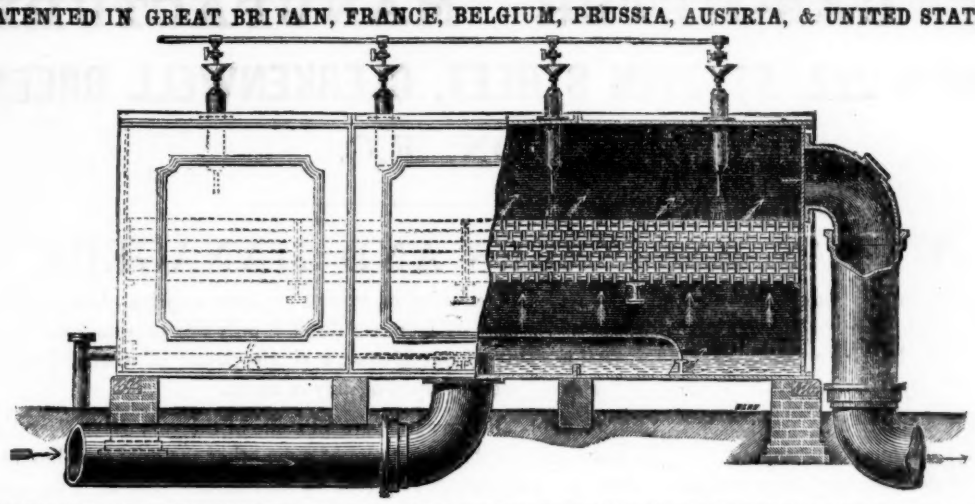
GERALD J. TUPP, 8, John Street, Adelphi, W.C., LONDON,

SOLE AGENT FOR ENGLAND AND WALES.

GAS PURIFICATION.

SAVILLE'S SELF-DISTRIBUTING GAS SCRUBBER-WASHER.

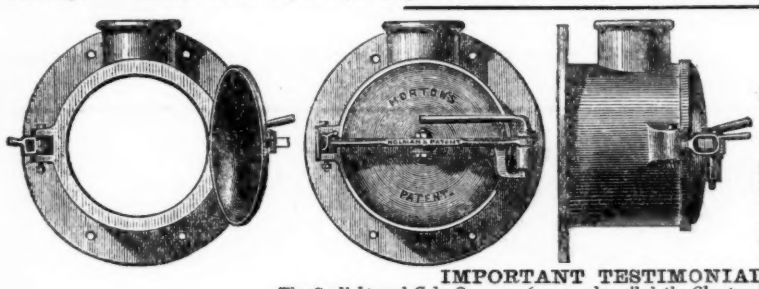
PATENTED IN GREAT BRITAIN, FRANCE, BELGIUM, PRUSSIA, AUSTRIA, & UNITED STATES.



MECHANICAL ARRANGEMENT.—The Washer Tank contains a large bottom chamber, into which the Gas is freely admitted through an ordinary full-way inlet-pipe, passing first under an inverted vessel which removes any Tar remaining in the Gas after leaving the Condenser; it then rises slowly over the whole surface, CONTAINING AN AREA OF ABOUT EIGHT TIMES THAT OF THE INLET-PIPE, through equidistant spaces in a series of Self-Sealing Water Troughs, arranged in tiers, dividing itself and passing through the various dips until it reaches the upper chamber, and from thence through the outlet-main. The washing liquid being CLEAN WATER is admitted by the Syphon inlets on top of Tank to the upper row of troughs, running through each successive tier, and becoming impregnated with the impurities extracted from the Gas, gaining strength at each dip on its descent, and finally passing off by the outlet syphon at the bottom. It will be observed that in this Scrubber-Washer the Gas comes first in contact with THE STRONGEST LIQUOR at the bottom, and passes through WEAKER LIQUOR at each successive tier, until it issues through CLEAN WATER into the upper chamber; hence the true principle of Gas Purification by Washing is simply and automatically effected.

ADVANTAGES.—Great economy in first cost and foundations; great saving of other purifying apparatus and material; occupies little space, and stands only a few feet in height; being entirely self-acting, requires no motive power either for purifying or distributing; the Gas is washed several times in ONE vessel, each time in liquor of a different strength, ultimately passing through CLEAN WATER; produces liquor of any required strength by once passing through; can be fixed (if desired) at any elevation to permit Contractors' tanks being filled without the expense of pumping.

One of these Scrubber-Washers has been in successful operation for the past twelve months at the Sowerby Bridge Gas-Works, and they are now being erected at the Corporation Gas-Works, Adderley Street, Birmingham, and at the Phœnix Gas-Works, Vauxhall, London.



MORTON'S PATENT SELF-SEALING RETORT-LIDS,

WITH

HOLMAN'S NEW PATENT BRACKETED CROSS-BARS, ANTI-FRICTION CATCHES AND ECCENTRIC FASTENINGS.

Instantaneous Sealing effected. No Luting. No Duplicate Lids required. Holman's New Self-Sustaining Cross-Bar ensures freedom of joint and maintains parallel position of the Lids.

Since their introduction in 1869, these Patent Retort-Lids have been thoroughly tested (rigid cast iron is now successfully employed), nearly 25,000 being in use at various Gas-Works in London and the Provinces.

IMPORTANT TESTIMONIAL.

The Gaslight and Coke Company (commonly called the Chartered Gas Company), Beckton, North Woolwich, July 2, 1874.

MESSRS. TANGYE BROTHERS AND HOLMAN.

Gentlemen,—In answer to your inquiry respecting the Self-Sealing Lids, I beg to say that they continue to work well, and I have every reason to be satisfied with them. I should be very sorry to return to the old system of Luting, and our stokers here freely acknowledge the benefit to them of the new system.

I am, yours truly, (Signed) G. C. TREWBY.

HUNT'S PATENT EQUILIBRIUM GAS-GOVERNOR.

In this Governor a Throttle-Valve is substituted for the ordinary suspended Cone, all external communications being avoided by placing the Lever or Radius Arm (shown in the drawing) inside the Valve-Chamber upon the Disc. The Disc is carried upon steel centres, upon which it is accurately balanced and turns freely. The friction in working is thereby reduced to a minimum. This Governor is extremely sensitive to alterations of inlet or outlet pressure, and renders a large actuating holder unnecessary.

The principal advantages of this arrangement over the ordinary form of Governor are as follows:—

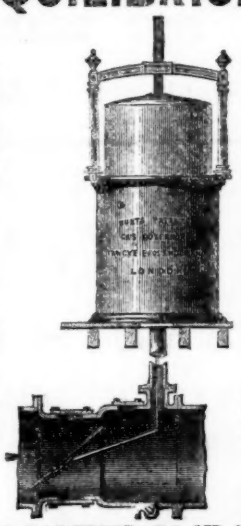
Its sensitive action prevents oscillation.

It is self-adjusting—*i.e.*, it maintains a steady pressure under variations of inlet pressure or a fluctuating consumption.

The inlet to Gasholder being contracted to the smallest possible dimensions, all danger from leakage through insufficiency of seal, tilting, &c., is entirely avoided.

The valve portion being separate from the holder, it can be handled and fixed like an ordinary Slide-Valve direct in the main; and the holder can be placed at any convenient distance immediately above it. The cost is thus materially reduced, and the inconvenience of heavy lifts done away with.

There are no working parts likely to get out of order.



These Governors have been adopted by many leading Companies, among whom are the following:—

The Gaslight and Coke Co. (9), The London Gas Co. (3), and at Abergavenny, Birmingham, Cannes (France), Devonport Dursley, Exeter, Mentone (France), Monmouth, Newcastle-on-Tyne, Oxford, Plymouth, Rochdale, &c.

TESTIMONIAL.

The Gaslight and Coke Company,
9, Water Street, New Bridge Street,
Blackfriars, E.C., Feb. 27, 1875.

MESSRS. TANGYE BROTHERS AND HOLMAN.

Gentlemen,—The two 24-inch and three 36-inch Hunt's Equilibrium Governors supplied by you, and fixed in the valve-rooms at Whitechapel, Goswell Road, and Blackfriars, are working very satisfactorily.

Yours truly,

(Signed) JOHN JOHNSON.

PRICES AND FULL PARTICULARS ON APPLICATION TO

TANGYE BROTHERS & HOLMAN,

SOLE MANUFACTURERS,

LAURENCE POUNTNEY LANE, LONDON, E.C.

THOMAS GLOVER & CO.,

DRY GAS-METER MANUFACTURERS,

214 TO 222, ST. JOHN STREET, CLERKENWELL GREEN,

LONDON, E.C.

TO GAS ENGINEERS AND MANAGERS.

It having come to our knowledge that a report is in circulation, spread by some unprincipled person or persons, that the cases of our larger-sized Meters are made of Galvanized Iron, we think it only fair to ourselves, and just to our customers, to say, that we never have used, in making any of our Meters, a single pound of *Galvanized Iron*, or any other *cheap* and *inferior material*, and this can be easily seen by opening any of them.

The cases of our large-sized Meters, from 20 lights and upwards, are all made of the very *Best Best Patent Alloy*, which is nearly double the price, and will last more than double the time, of some other material that has been and still is very largely used for the same purpose. And our experience, acquired by an extensive use of it for upwards of 30 years, enables us to say with confidence that no other metal in use for the purpose is so little liable to corrosion from the action of the gas.

We have now in use a Meter made in 1848, and therefore 29 years old, the case of which is made of Patent Alloy; the Meter is still in perfect order, and shows no signs of decay.

The utmost care is exercised by us in selecting none but the very best materials for all parts of our Meters; much of it is made *expressly for us*, as it is not possible to obtain it in the open market of the same superior quality.

The great fall in the price of all materials used in making our Meters has enabled us to give an increased discount, thus giving our customers the benefit of the fall. This we were bound in fairness to do, as we raised the price of our Meters four years ago, when the price of all metals went up.

It will be our constant endeavour, by using none but the best materials, and employing the most skilful workmen, to maintain the high character our Meter has hitherto borne.

WILLIAM PARKINSON & CO.,

(SUCCESSORS TO SAMUEL CROSLEY,)

COTTAGE LANE, CITY ROAD, LONDON, E.C.

Established 1816.

MANUFACTURERS OF PATENT

WET & DRY GAS-METERS,

STATION-METERS WITH PLANED JOINTS,

GOVERNORS, PRESSURE REGISTERS, GAUGES,

AND EXPERIMENTAL APPARATUS,

STREET-LAMP METERS,

AND REGULATORS FOR AVERAGE METER INDICATION.

METERS FOR MEASURING WATER.

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TO CORRESPONDENTS.

No notice can be taken of anonymous communications. Whatever is intended for insertion, must be authenticated by the name and address of the writer; not necessarily for publication, but as a guarantee of good faith.

A. B.—*A gas or water company desiring to obtain a Provisional Order under the Gas and Water Works Facilities Act*, 1870, *must give notice by advertisement, during the month of October or November, of their intention to apply to the Board of Trade for the purpose. The Order, if granted, will be included in a confirmatory Bill in the next session of Parliament. The Board of Trade fee, on deposit of the Draft Order, is £35. The Board, on application, will furnish printed instructions as to all necessary steps to be taken by a company. No company is safe without an Order or a special Act.*

N. T.—*Your communication is under consideration.*

J. H. *asks:* "*Can a gasholder be interdicted as a nuisance under the Public Health Act in Scotland, by its being within a certain distance of dwelling-houses?*" *We think not, but a Court of Equity may be moved for an injunction to restrain the erection.*

THE JOURNAL OF GAS LIGHTING,
WATER SUPPLY, & SANITARY IMPROVEMENT.

TUESDAY, MARCH 13, 1877.

Circular to Gas Companies.

On inquiry, the communication made to the Metropolitan Board of Works by the Board of Trade, relative to the testing-stations of the Metropolitan Gas Companies, proves to be anything but lengthy. It is a very short letter, the substance of which we published last week; but another brief notice is required. The communication opens with a reference to previous correspondence, of which we have no exact knowledge, and then it goes on to mention, that the Board of Trade had suggested to the Parliamentary Agents of the Chartered Company the introduction into the Bill they are now promoting, of "a clause or clauses "dispensing with the necessity of specifying the station from "which the gas is delivered, before the forfeiture to which the "Company may have made themselves liable can be recovered." It is added, "that the Board of Trade do not consider the diffi- "culty, to which attention has been drawn, of sufficient impor- "tance to render the introduction of a public Bill for the "amendment advisable." This opinion, however, is not shared by the Metropolitan Board of Works, who, at their meeting last Friday, passed a resolution requesting the Board of Trade to introduce a short Bill. So far there would seem to be no disagreement as to the necessity for the enactment proposed; and whether it be made by an addition to the Bill of the Chartered Company, or by a separate measure, is a matter of little consequence. The important thing to be decided is, as we pointed out last week, the basis on which the amount of the forfeiture is to be calculated. We do not believe that any forfeiture is likely to be incurred for any defect designedly caused; but accidents will happen, Local Authorities are cantankerous, Magistrates are capricious, and Gas Companies are considered fair game for plunder; so it is very essential that any alteration in the law shall distinctly set forth the mode by which the fine for any default is to be computed. It is clear, that if we cease to specify the station making default, the forfeiture can no longer be calculated on the amount of gas sent out from, or made at, any particular station on a given day. A radical alteration is necessary. The present system of assessing the fine must be altogether abolished. For the future, it must be enacted that the forfeiture shall be a lump sum for every half candle in default, irrespective of the amount of gas manufactured. That, we think, will remove all difficulty, and satisfy every one. We shall not here suggest any sum of money in which we think it might be fair to mulct the Company. We content ourselves with pointing out the imperative necessity for the alteration of the law, which, as it now stands, cannot be applied to the Chartered Company, unless the testing-places be removed to the several manufacturing stations. If that be done, the law may fairly remain as it is.

The concluding part of the letter from the Board of Trade suggests that the permanent officials are not particularly well acquainted with the circumstances of the Metropolitan Gas Companies. After stating that the proposed clause or clauses will remove all difficulty, so far as the Chartered Company are concerned, it goes on to say that, "in the case of the Com- "mercial and South Metropolitan Gas Companies, the only "other Companies concerned, and whose manufacturing "stations *are not numerous*, it appears to the Board of Trade "that the difficulty, which must be but slight, must stand over "for the present." Now, the South Metropolitan Company have but one manufacturing station, and there is no difficulty at all. The Commercial Company have two, and we have no doubt that the mains from each communicate. But, however that may be, we claim equal laws for all the Companies concerned. If the Chartered Company be relieved in the way indicated above, which we believe is the only way in which it can be done, the other two Companies must be relieved to an equal extent, and this can only be accomplished by the introduction of a public Bill. For once we agree with the Metropolitan Board on a gas question.

The specific announcement is made, that the Metropolitan Board are opposing the Bill promoted by the Chartered Company to relieve themselves of the "sulphur" difficulty, and we understand that the Corporation of the City of London will join in the opposition. Both Company and Authorities are, so to speak, furbishing their arms, and the contest, we believe, will be second in interest to none which has preceded it in the history of gas manufacture. Necessarily, it will be mainly a chemical fight; but we shall not now point out the lines which the opposing parties will adopt. The broad question is, Does "sulphur" in gas do harm to man or materials, and, if so, in what way does it do mischief? This, we believe, is the proposition that will be put before the Committee of the House of Commons; and since the evidence will be very conflicting, and it is likely that no member of the Committee will ever have heard of the matter before he is called on to consider it, the decision may be waited for with some curiosity.

Earl Camperdown's Bill, intended to effect a reform in the constitution of the Metropolitan Board of Works, as everybody expected,

fell through. This well-intentioned young nobleman is not yet in a position to carry any measure of organic reform. If he persevere and exercise discretion, he is certain some day to be a Minister of State, and then he will be in a position to use with advantage the knowledge he is acquiring to-day as to the working and constitution of our Local Authorities. The debate on the Bill was, however, so far satisfactory that it evoked a pretty general expression of opinion that the time had come when something ought to be done to improve the Municipal Government of London. Earl Beauchamp's objection to any alteration in the mode of election was characteristic. He saw clearly enough that, if the Board were elected by popular vote, the majority of the present members would be sent home to mind their private affairs. We think this would be an advantage to the Metropolis; but the noble Earl said it would be a "waste "of experience." London would survive it. What an awful "waste of experience" was caused by the last general election, and yet the government of the country goes on, and men with great reputations can hardly be said to be missed. *Il n'y a pas d'homme nécessaire*, said a Frenchman—Voltaire, we rather think; and if some who chatter in Spring Gardens were sent to mind their own businesses, a positive gain would be accomplished. The Board may be congratulated on one thing. They have acquired the services of an eminently practical permanent staff, and new members might be safely left to the guidance of these gentlemen until they are able to run alone.

An objection to an increase in the number of members of the Board struck us as singular, since the anomalies of the present system of representation have been sufficiently pointed out by Mr. Scott, Chamberlain of the City of London, and others. Forty-six members of the Metropolitan Board may be said to rule over property of the rateable value of £23,000,000, while in the City of London 280 Aldermen and Common Councilmen look after the affairs of a community rated at about one-sixth of that sum. They do something more, we know; but that does not affect our argument. Talking, some years ago, with an influential member of the Common Council, we objected to the large number of Councilmen, and suggested that a reduction in the number would effect an economy—at all events, in the item of dinners. The reply astonished us. We were told that large numbers was the only safeguard against jobbery. We felt bound to believe the statement, and although we do not say that the safeguard is required, we should be glad to see it extended.

We may call attention to the modest inaugural address of Mr. Hutchinson, the President of the Manchester Association of Gas Managers, printed in another column, in consequence of his brave defence of the rights of his fellow-managers. There are several instances in which, when a gas undertaking has been transferred from a Company to a Local Authority, good and useful men, past the prime of life, have been turned out into the cold with very scanty compensation, to get a living as they best could. This, as Mr. Hutchinson says, is not as it should be. If the manager in office be not worthy of confidence, by all means let his services be dispensed with; but, if competent, and of good character, it is the grossest injustice to get rid of him in order to make room for some friend of a Councilman. The post of gas manager is, perhaps, the most harassing that a human being can occupy, but no one has any pity on the occupant, who is always represented as earning a "princely" salary, and living in ease and luxury. We have quite recently seen it alleged, in print, against a gas manager, as almost a crime, that he had bought a picture. That years of honest labour, with prudent habits, should have enabled a man to accumulate capital, and that self-cultivation should have developed a taste for art, would, by every right-minded person, be deemed meritorious. Not so, we are told, in the case of a gas manager. His "princely" salary, it is said, comes out of the pockets of the public (what salary does not? we should like to know), and therefore the purchase of a picture by a gas manager is a proof that the public are being plundered. And this in a London newspaper!!

It is a very small affair, but we may mention that the Ilkeston Local Board have proposed to buy up the Ilkeston Gas Company, by paying £12 for each share of £10, with £6 10s. paid up. The Company have, we understand, declined this offer.

Farnworth is another very insignificant place, but it has an ambitious Local Board, who are anxious to start gas-works in the face of a Gas Company. We are sorry, on some accounts, that the Local Government Board will step in to prevent a waste of the ratepayers money, for one or two shocking examples of the evils of competing works, so far as they affect ratepayers, might be useful.

Gas affairs are still exciting a good deal of attention at Leeds. The magistrates have recently discovered that Sugg's "London" Argand, No. 1, is used in testing the illuminating power of the gas. The Leeds Gas Act contains a section which provides that the gas shall be tested with a fifteen-hole Argand, *or other approved burner*. We believe that these last words fully justified the gas officials of the Corporation in substituting the "London" Argand for the Sugg-Letheby burner. That the former is an "approved" burner, is shown by the fact that its use has been prescribed in almost every Gas Act passed within the last three years. It would seem, however, that the Gas Committee of the Corporation have given way on the point, and that Leeds gas will, in future, be tested by the Sugg-Letheby burner. Now, in view of the proposed increase of illuminating power to eighteen-candles, this is a very important matter to the Corporation, and, seriously speaking, we do not believe that the consumers will be in the least benefited. They will continue to use "rusty" burners, and the eighteen or twenty candle gas, which the Corporation send out will, in the consumers apparatus, yield the light of twelve candles, and, it may be, fewer. Thus the increase will result in a sheer waste.

The Leeds Chamber of Commerce also appear on the scene, and raise objections to the quality of the gas, which, however, they do not press; but one member urged, rather offensively, that the works, having cost the Corporation a million of money, should be placed under the control of an eminent engineer, cost what it might. In Mr. Woodall, the Corporation have an engineer of large experience and unquestioned ability and character, and the best thing the Corporation can do is to follow *his* advice, cost what it may.

The worst is that Corporations, and Gas Companies also, sometimes, will tinker when they ought to make complete renewals. Look at Mr. Newbigging's report on the Coleraine works. Badly situated to begin with, they have been starved, and not developed according to the requirements of the town. The result has been a serious loss in several directions, the worst being a leakage of twenty-four per cent., in consequence of mains of inadequate dimensions and badly-laid services. The porous soil in which these latter are placed makes it advisable that when they are re-laid, in accordance with Mr. Newbigging's suggestion, they should be embedded in pitch, according to the mode now practised by the Chartered Company.

The gas undertaking of the Corporation of Hereford has in the past year yielded a net profit of £3504, and the Gas Committee very properly report that they think a reduction of price should be made. They propose to take off sixpence per 1000 feet for the supply of public lamps, and threepence per 1000 to private consumers who pay promptly. The reduction, it seems, will only make a difference of £700 in the profits of the current year, so it is clear that the price might have been further lessened. This thought occurred to some members of the Corporation, but the report of the Committee was unanimously adopted.

The Corporation of Stockport are also reducing the price of their gas fivepence per 1000 all round. Differential rates are charged according to the amount of gas consumed. We must say that the rates outside the borough look to us excessive, but probably they can be justified.

The reports of meetings we publish continue to show the prosperous state of gas undertakings. The Dover Company pay a dividend of seven-and-a-half per cent. The Directors have been selling new shares by auction, and have realized premiums of fifty per cent., and they are about to repeat the operation. We have not the Dover Gas Act before us, and, therefore, we cannot say positively, but to the best of our recollection it contains no clause compelling the sale of shares by auction. Under these circumstances, we are disposed to contend that the Directors can only sell new shares with the consent of the general body of existing shareholders. If they choose to waive their legal right to participate in new issues at par, all well and good; we may commend the act of self-denial. We feel bound, however, to stand up for the rights of the shareholders, and to point out that the Directors are acting *ultra vires*, when they sell new shares by auction without the consent of existing holders.

CLEVEDON WATER COMPANY.—The half-yearly meeting was held on the 27th ult.—Sir A. H. Elton, Bart., in the chair. The report stated that the receipts for the past year amounted to £1272 4s. 6½d., being an increase on the previous year of £38, allowing of a dividend of 4½ per cent., free of income-tax, leaving a balance of nearly £20 to be carried to the credit account of 1877. The whole of the company's machinery had been inspected, and was in good condition.

EASTBOURNE GAS COMPANY.—The half-yearly meeting of shareholders was held on the 26th ult.—Dr. Jeffery in the chair. The report, which we published on the 20th ult., was received and adopted, and a dividend of 10 per cent. upon the £20,000 original capital of the company, and a bonus of 5 per cent. upon the same capital on account of deficiencies in dividends of former years, was agreed to. At the close of the ordinary business, an extraordinary meeting was held, when it was agreed unanimously to raise the sum of £5000 on account of the capital of the company, by the creation and issue of 500 additional "B" shares of £10 each. It was further resolved that the new shares be offered first to the present shareholders in proportion to the number of shares held by them.

Water and Sanitary Notes.

NOTWITHSTANDING the reports to the contrary, we believe that the supply of water to Richmond is in a most unsatisfactory state, and that it is likely to remain so for an indefinite time unless the amount furnished by the Vestry be supplemented from some other source. The inhabitants are becoming very impatient, and we have reason to believe that overtures have been, or will be, made to the Southwark and Vauxhall Company to restore the supply. We hope the Company will meet the town in a liberal spirit, and not repeat past errors. It seems that one of the submerged pumps in the well of the Vestry has already been recovered, and this would appear to indicate that when efficient pumping apparatus is applied, the well will soon be dry again. It is considered, however, that the bore-hole is not yet clear, and that further efforts may eventuate in a much larger yield of water. But when the reservoir of the Vestry will be filled—until which time the supply cannot be satisfactory—nobody seems to know. A short time ago we were told that it contained only a few feet of water, having a very unpleasant appearance, and it was thought desirable to pump this out before more was put in. Whether or not this has been done we do not know. In any case, the process of filling the reservoir goes on very slowly, and the dog days may arrive before the inhabitants of Richmond get a full supply of water from the Vestry.

There seems to be a probability that the undertaking of the Bristol Water-Works Company will pass into the hands of the Corporation of that city. Negotiations have been for some time in progress. The Corporation offered ten per cent. perpetual Annuities, but this offer the Company declined. For some years after the works were started, we believe, the Company paid no dividend. Then a three per cent. dividend was declared, which has gradually increased, until for the last few years ten per cent. has been paid, and the Company are now in a position to commence the payment of back dividends. Under these circumstances the Directors asked for Annuities of twelve per cent., terms to which the Corporation have given a qualified assent. They offer ten per cent. for the next five years, after which they will pay the additional two per cent. Doubtless this arrangement will be accepted, and the Bristol Water-Works Company will disappear. Despite the somewhat onerous conditions, we believe the Corporation will, in a very few years, become well satisfied with the purchase.

It is hardly necessary to say that, under the circumstances, the Corporation will oppose the Bill of the Bristol District Water Company, who seek to start a competing supply in the city and suburbs. We feel satisfied that Parliament would never have sanctioned the scheme, but the opposition of the Town Council definitively settles its fate. We shall have occasion to refer to the proposed purchase at a future time.

We are glad to see that the Corporation of Newcastle have agreed to withdraw their opposition to the Bill of the Newcastle and Gateshead Water Company on conditions which have been accepted. The Company, in their Bill, propose to complete the Hallington reservoir, which is to hold six hundred million gallons, within four years, and the Swinburne reservoir, calculated to hold one thousand million gallons, within the next ten years. The Corporation are anxious to have the larger storeage completed first, and the Company have agreed to modify their Bill, so as to make it incumbent on them to complete the latter reservoir in four years, and the first-named within nine years; the Company have further engaged to separate the domestic and trade supplies by the 1st of September next; and so the Corporation and Company shake hands.

The Association of Municipal Officers have once more tried to persuade Mr. Cross to assist them in getting the Municipal Corporations (Borough-Funds) Act repealed. The Home Secretary, however, does not see it. He fails to recognize, in an appeal to the ratepayers, any infringement of the principles of Local Self-Government. We regret the results of the application of the Act in one or two instances, as we do the results of an appeal to a popular vote on a good many occasions. As regards the particular question under consideration, we must protest against the principle laid down by these Associated Municipal Officers, that a Town Counil once elected shall be free to deal with the ratepayers money as they please. The House of Commons claims no such privilege.

INSTITUTION OF CIVIL ENGINEERS.—At the monthly ballot on the 6th inst., Mr. Jos. Hepworth, manager of the Corporation Gas and Water Works, Carlisle, Mr. C. W. Jones, Gas-Works, Milan, and Mr. T. H. Martin, engineer and manager of the Gas and Water Company, Barnet, were elected as Associates of the Institution. There are now on the books 897 members, 1665 associates, 15 honorary members, and 440 students; together, 3017 of all grades—an increase of 208 since the same date last year, or at the rate of 7 per cent. nearly.

WATER ORDERS FOR 1877.

THREE Water Companies have applied to the Board of Trade for Provisional Orders to enable them to raise additional capital.

The *Bridport Water-Works Company* apply for power to raise £8000 additional capital, and to borrow £2000. If the money be raised by the issue of preference shares, the dividend is to be limited to five per cent.

The *Burgess Hill and St. John's Common Water Company, Limited*, apply for authority to raise £10,000 additional capital, without further borrowing power. The Order, if granted, will also extend the limits of the Company, so as to include Hurstpierpoint and Clayton.

The *Ruthin Water Order* will authorize the Ruthin Water Company to raise £4000 additional capital, and to borrow £1000. The Order provides that the Company shall, within three years, make such alterations and improvements in their existing works as the Ruthin Town Council shall approve, the works being executed to the satisfaction of an engineer appointed by the Council, one-half of whose remuneration is to be paid by the Company.

There is only one mixed Gas and Water Order.

The *Pickering Gas and Water Order* is applied for by a new (limited) Company, formed to supply the township of Pickering with gas and water. The share capital is not to exceed £10,000. The Order will authorize the acquisition of land, and the construction and maintenance of works. As regards gas, it will provide for the supply of fourteen-candle power, the charge for which is not to exceed 7s. per 1000 feet. But this curious provision follows:—"If at any time the undertakers shall raise the "price of gas above 5s. per 1000 feet, and the Local Board of "Pickering give notice that they consider the increased price too "high, then, if within two months the Company and the Board "do not come to some agreement, the question of price is to be "referred to arbitration, as provided by the Public Health Act, 1875." The source of the water is to be a well at Kellhead, within the township. The water-rates and extra charges proposed are just about those usually allowed.

Parliamentary Intelligence.

HOUSE OF LORDS.

MONDAY, MARCH 5, 1877.

The Lowestoft Water, Gas, and Market, the East Worcestershire Water, and the North-East Worcestershire Water Bills were committed.

Petitions were presented against the Londonderry Gas Bill from Corporation of Londonderry, and against the North-East Worcestershire Water Bill from (1) Corporation of Droitwich, (2) Sharpness New Docks and Gloucester and Birmingham Navigation Company, (3) Promoters of East Worcestershire Water Bill, (4) Thomas Worthington, (5) Henry Wheeler Baker.

TUESDAY, MARCH 6.

The Londondery Gas Bill was committed.

Earl DE LA WARR gave notice that, on Monday, March 12, he would call attention to the operation of the law with reference to the local government of the Metropolis, and move for return of the sums expended by vestries and district boards within the metropolitan district, exclusive of the City of London, upon paving, lighting, drainage, water supply, sanitary arrangements, and other works not under the jurisdiction of the Metropolitan Board, during the years 1874, 1875, and 1876.

HOUSE OF COMMONS.

MONDAY, MARCH 5, 1877.

The Newcastle and Gateshead Water, and the United General Gas Company (Limerick) Bills were read a second time, and committed.

The Examiners reported that the further Standing Orders applicable to the Bristol United Gas, and the Epsom and Ewell Gas Bills have been complied with.

TUESDAY, MARCH 6.

The Southend Gas Bill was read a second time, and committed.

The Sittingbourne Gas Bill was reported.

The Wakefield Gas, Wakefield Improvement, and Leeds Improvement Bills were referred to a select committee, consisting of Mr. Paget (chairman), Mr. Stopford Sackville, Mr. Herbert, Lord Tavistock, and Sir John Duckworth (referee); to meet on Tuesday, March 13.

The Middlesbrough Corporation Bill was referred to a select committee, consisting of Admiral Egerton (chairman), Mr. Halsey, Sir John Amory, and Captain Digby; to meet on Tuesday, March 13.

The Ramsgate Local Board, Ramsgate Water, Thanet Gas, Tunbridge Wells Water, and Kent Water Bills were referred to a select committee, consisting of Mr. Assheton (chairman), Mr. Smith, Mr. Bell, Mr. Dundas, and Mr. A. Bonham-Carter (referee); to meet on Wednesday, March 14.

The Longton Corporation and Rotherham Corporation Bills were referred to a select committee, consisting of Mr. Monk (chairman), Mr. Denzil Onslow, Mr. Balfour, and Sir George Campbell; to meet on Thursday, March 15.

THURSDAY, MARCH 8.

The Examiners reported that the further Standing Order applicable to the Crystal Palace District Gas Bill has been complied with.

A petition in favour of the Crystal Palace District Gas Bill was presented from Owners, &c., of property at Lower Sydenham.

Requisitions to withdraw their petitions against the Wakefield Improvement Bill were presented from (1) Lancashire and Yorkshire Railway Company, (2) Aire and Calder Navigation Company.

FRIDAY, MARCH 9.

A requisition to withdraw their petition against the Newcastle-under-Lyme Borough Extension and Improvement Bill was presented from the Stoke Fenton and Longton Gas Company.

The select committee on the Longton Corporation and Rotherham Corporation Bills was altered by the appointment of Sir Dudley Majoribanks (chairman) and Lord Muncaster, in place of Mr. Monk and Mr. Onslow.

LOANS FOR SANITARY PURPOSES.

Mr. Whitbread asked the President of the Local Government Board what was the amount of the loans for which the sanitary authorities had asked the sanction of the Local Government Board since the date of the last return presented to Parliament, distinguishing the amount required by the urban authorities and the amount required by the rural sanitary authorities.

Mr. Sclater-Booth said the last published returns of loans to urban sanitary authorities showed that the sanction of the Local Government Board had been given to loans amounting to £1,835,797 to urban sanitary authorities. Since that time, although the accounts were not completed for the year 1876, sanction had been given to the urban authorities for the borrowing of £2,506,459, showing an increase of £670,662. In the case of the rural sanitary authorities, the amount, by the last returns, was £137,308, and during the year 1876, £200,692, showing an increase of £62,384.

Mr. Whitbread asked if the right hon. gentleman would inform him what had been asked for, and not what had been sanctioned.

Mr. Sclater-Booth said that would take some time to ascertain, but he would endeavour to obtain the information.

Saturday, March 10.

The petitions were withdrawn of the London, Chatham, and Dover Railway Company against the Ramsgate Local Board Bill; of the Corporation of Wakefield against the Wakefield Gas Bill; and of the Justices of the Peace for the West Riding of the County of York against the Wakefield Improvement Bill.

Legal Intelligence.

HIGH COURT OF JUSTICE—CHANCERY DIVISION.

Thursday, March 1.

(*Before Vice-Chancellor* Bacon.)

BAKER *v.* CORPORATION OF WISBECH.

This was a motion to restrain the defendants, the Urban Sanitary Authority, by injunction, from causing or allowing sewage, or rather offensive matter, to pass from the drains of the bars of Wisbech into an open ditch on the west side of the plaintiff's house.

Mr. Kay, Q.C., and Mr. Kekewich appeared for the plaintiff; Mr. Hemming, Q.C., and Mr. Ingle Joyce appeared for the defendants.

Mr. Kay said the plaintiff, who was the occupier of Colville House, by the present motion sought to restrain the Urban Sanitary Authority from being an urban unsanitary authority. The plaintiff's grounds were bounded on the west by a road called Jail Lane, in which was an open ditch. On the termination of the open ditch was a sluice, from which the plaintiff obtained a supply of water for the fish-ponds on his property. About two years ago the defendants, without notice or authority from the plaintiff, put in two pipes at the upper or southern end of the open ditch, from which was discharged sewage matter. The sewage matter so sent into the ditch, polluted the water entering the fish-pond, and had killed all the fish. The plaintiff further stated that when the wind was blowing towards his house, it was impossible to have the windows open, in consequence of the stench coming from the ditch. On May 18, 1875, the plaintiff wrote to the mayor, complaining of the stench, and stating that unless the same were immediately remedied, he should be compelled to take legal proceedings. After some further correspondence, and the defendants not abating the nuisance, the plaintiff and his son endeavoured to stop up the pipes, and in so doing one was broken. The defendants thereupon summoned them for maliciously breaking the pipe, and the son was fined one shilling by the magistrates. Numerous letters passed between the parties relating to the nuisance, and the defendants stated that all nuisance would be removed as soon as certain works, then in progress, were completed. Upon such promise the plaintiff abstained from taking proceedings; but the nuisance not having been remedied, he was compelled to come to the Court for an injunction. The learned counsel then read the affidavits of medical and other gentlemen, stating that the nuisance from the open ditch had been brought to the plaintiff's residence within the last two years, and that the effect of the noxious gases emitted from the ditch was most prejudicial to health. The defendants did not deny that the sewage which came by the pipes into the ditch was a nuisance, but they said the nuisance was caused by the illegal acts of the inhabitants on the other side of the street, and that such nuisance was, therefore, not caused by any neglect on their part. But the plaintiff maintained that it was the duty of the defendants to prevent such illegal acts being committed. The defendants further relied on the 264th section, which stated that before any writ or process was issued against any local authority one month's notice in writing must be given of the cause of complaint, and that proceedings should be taken within six months of such notice. But that, he (Mr. Kay) submitted, only applied to an action for damages, and it had been so decided by the case of the *Attorney-General v. The Hackney Local Board*. In conclusion, he asked that an injunction might be awarded against the defendants in the terms asked for.

Mr. Hemming, Q.C., said, before entering into the facts of the case he had a preliminary objection to make, upon which he would take his lordship's opinion. The section referred to by his friend stated that no writ or process should be issued or served without one month's notice being given, and that proceedings should be taken within six months after such notice. The notice given by the plaintiff was dated March 24, 1876, and the proceedings not being taken within the specified time, he submitted, was a fatal objection to the motion.

The Vice-Chancellor said he did not entertain the slightest doubt that, if a notice was requisite, sufficient notice had been given. Notice was given of the nuisance, its receipt was acknowledged, and promises were given in plain terms that the nuisance should be abated, and upon such promises the plaintiff stayed his hand.

Friday, March 2.

The hearing of the motion was resumed this morning, when

Mr. Hemming said he had now to deal with the case upon the facts; and he thought when his lordship was in possession of the whole case, he would come to the conclusion not only that the local board had done their duty strictly according to their Acts, and in the wisest possible way, but that the plaintiff's case was one of the most unfounded that had ever come before the Court. In cases like the present, there was always a conflict of evidence on matters of opinion. The defendants witnesses stated that the nuisance had been much greater for 20 or 30 years before 1875 than it was at the present time, while the witnesses of the plaintiff stated that it had been more during the last two years than previously, and the plaintiff himself spoke of it as a pure stream until two years ago. It was proved that when the property belonged to the Commissioners of Sewers, and was not under the control of the local board, the ditch carried not only surface drainage but sewage, and that upon the property being taken over by the local board, sewage was stopped from entering the ditch. Therefore, it was rather strange to find the plaintiff stating that the stream was pure when sewage entered it, but impure when the sewage was diverted. In support of the defendants case, the learned counsel read the affidavit of the town-clerk, which stated that for some years previously to 1847 the sewer, while in the possession of the Commissioners of Sewers, was an open ditch into which sewage entered; that in 1864 part of it was filled up by the local authorities, and that, within the last two years, certain works had been executed, which had the effect of wholly diverting the sewage from the ditch. Mr. Henry Pooley, surveyor of the borough, also gave evidence to the same effect. The learned counsel said the only reason why drainage of slops and the like into the ditch was not stopped a year ago was because the plaintiff opposed the commissioners, who were ready to fill up the ditch, put in a drain, and carry even the surface water off. The plaintiff insisted that the site of the ditch belonged to him; and but for that contention on the part of the plaintiff, no nuisance could now possibly exist. Mr. Ford and Mr. Easton, the engineer, had made affidavits to prove this. The plaintiff, in reply, denied this, and said, "All I required was that, as I had the same right to take in the open ditch to my frontage, as other adjoining owners have done, my frontage should be properly protected."

The Vice-Chancellor said he could not see what this evidence had to do with the case before the Court.

Mr. Hemming said he used it to say that the Court would not grant an injunction at the instance of a man who had opposed the abatement of the nuisance of which he now complained; because such nuisance was, in truth, not due to the defendants, but to the plaintiff. The plaintiff also made a definite claim to the site of the ditch before the justices in 1875, when the defendants were about to purchase the ditch and fill it up. It was not possible, under such circumstances, that the plaintiff could successfully come to the Court and ask for an injunction. The evidence showed that the defendants had prosecuted their scheme with the greatest vigour; that they were going on with the utmost despatch, and were so nearly finished that they had already diverted to their sewage farm every particle of sewage which was regularly poured into any drain, and which formerly went into the ditch. There was a little district of the town where there were a number of houses not yet connected with the sewers; but this defect would be remedied within a very short time, if directed by the Court to be done.

Mr. Ingle Joyce, on the same side, contended it was proved by the evidence of the defendants that the ditch in question was, and always had been, a common open sewer, vested in the Commissioners of Sewers, over which the Commissioners of Sewers alone had authority; and there was no evidence on the part of the plaintiff which contradicted it. If the defendants were under a statutory liability to prevent the ditch from becoming a nuisance (which they were not), the plaintiff could only proceed in the manner pointed out by the statute, and the Court of Chancery had no authority in the matter which it could put in force against the defendants; and the plaintiff, if he could sue at all, could only do so at the instance of the Attorney-General as representing the public.

Mr. Kay, in reply, said the plaintiff objected to the plan proposed of filling up the ditch; but there was no difficulty in providing an alternative system, by which the nuisance could be got rid of. Indeed, the defendants own acts proved that no such difficulty existed. All that was necessary was, as a temporary measure, to take up two or three pipes, and put in some solid matter, through which their sewage would not soak. Thus the defendants had conclusively proved a case for granting an injunction.

The Vice-Chancellor, in delivering judgment, said the case was a remarkably plain and distinct one. The plaintiff, it appeared, was the owner of a house called Colville House, and on the west side of his grounds was a ditch, into which the defendants, two years ago, caused to be inserted a pipe, connected with the drains of the borough under their control. Through this pipe sewage matter and other offensive matters passed, evolving noxious gases injurious to health. The defendants had promised to abate this nuisance, but, as yet, had failed to do so. Such was the plaintiff's case, and, if true, he had a right to the relief asked. The defendants, it appeared, had paramount powers by Act of Parliament over all drains and sewers in the district. The property of the ditch, at one time, was in the Commissioners of Sewers, but afterwards devolved upon the defendants, and they, finding the drain was in a defective state, took steps to remedy it; they filled up a certain portion, and made a system of drainage, which they said was perfectly effectual to drain the whole town, and would carry the filth to a place distant six miles from Wisbech. It was also said that the plaintiff was put out of Court by objecting to the works of the defendants; but that, in his lordship's view, had nothing to do with the case. The defendants made a drain for the purpose of carrying off surface water, but neglected to provide certain houses close by with a drain for carrying away the sewage, and consequently the inhabitants of those houses poured slops, &c., down the gulleys into this surface drain. The defendants said this was done without their knowledge or consent, but it should not be forgotten that it was through their neglect that this was done, and that they had provided the means for its being done; and they now claimed a right to pour that into the sewer running on the western side of the plaintiff's property. They then sought to shelter themselves under the pretext that, inasmuch as they made a drain for surface water, if anybody else had polluted the drain it was not the fault of the defendants, they not having consented to it, or permitted it willingly and knowingly. But that defence was answered by their having furnished the sewer. It was said the ditch was foul previously, but that was no reason why the defendants should make it worse. In his lordship's opinion, the plaintiff was entitled to an injunction restraining the defendants from causing or allowing sewage or other offensive matter to pass from the drains in the borough of Wisbech into the open ditch on the west side of his grounds.

Mr. Hemming asked that the injunction might be suspended for three months, in order that the defendants might do the work necessary to prevent a continuance of the nuisance.

Mr. Kay said as it was a matter affecting the health of the plaintiff he must object to so long a time being given. If a month were given, and it were found insufficient, the defendants could apply for an extension of time.

The Vice-Chancellor directed that the injunction should not be enforced until after the expiration of two months.

Saturday, March 3.

In re the new gas company, limited.

In this case a petition was presented by William Beale, of 370, Holloway Road, Middlesex, a shareholder, praying for a compulsory order to wind up the company.

Mr. Kay, Q.C. (with whom was Sir H. M. Jackson, Q.C., M.P., and Mr. Latham), for the petitioner, stated that the company was formed under the following circumstances:—In the year 1872, William Denny Ruck obtained two patents for the United Kingdom for two processes for the manufacture of gas. One consisted principally in driving atmospheric gas

through petroleum spirit, and so producing what was called air gas, and the other consisted principally in manufacturing hydrogen gas by decomposition of water, and passing the hydrogen gas through petroleum spirit. Before the incorporation of the company, Ruck sold the patents to William Eckersley for £12,000, it being agreed between them that £10,000 should be paid in shares of a company to be formed for purchasing the patents, and £2000 in cash. The company, which it was now sought to wind up, was incorporated on the 24th of January, 1873, with a capital of £500,000, divided into 100,000 shares of £5 each, having for its object the acquisition of the patents. Two prospectuses were issued, one on the 24th of January, 1873, and the other on the 1st of March, 1873, and both, according to the petitioner, contained a great number of very exaggerated, false, and fictitious statements of the value of the patents, and also a statement that, in addition to the patents for the United Kingdom, the necessary steps had been taken to obtain patents for the same processes for upwards of fifty different countries. Immediately after the incorporation of the company, the patents for the United Kingdom were sold by Eckersley to the company for £125,000, £50,000 being paid in cash and £75,000 in fully paid-up shares. The petitioner alleged that Eckersley was only the agent of certain promoters of the company, the chief of whom was Albert Grant, the rest being his nominees, and that the difference between £12,000, the purchase-money paid by Eckersley, and £125,000, the purchase-money paid by the company, was divided between the promoters, so that they became owners of a largely preponderating number of shares in the company, and would, no doubt, object to a winding-up order. The petitioner was the registered holder of 240 shares, 200 of which he bought in the market without having any knowledge of the profits which had been made, by the directors and promoters, in the purchase of the patents. Upon the patents being applied to the manufacture of gas, they proved a total failure, the company discontinued the manufacture of gas, and the patents were allowed to lapse in September, 1875. So far as the petitioner knew, no foreign patents had ever been acquired by the company, but if they had been they had never been used, and had since expired. In the year 1876 the company made experiments with Coll's patent for the manufacture of gas, but the patent proving a failure, the experiments were relinquished in April, 1876, without the patent ever having been applied to the business of the company. The company, up to the present time, though without success, were endeavouring to earn profits, but not in the business for which they were originally formed. They acquired a concession for a certain number of years for lighting Tunis, in North Africa, with gas, and they intended to apply their patents for the purposes of the concession; but in consequence of the failure of the patents they had been obliged to light Tunis with common coal gas, which they were actually doing at a loss. They had also entered into a contract, of which four years still remained unexpired, to light Paddington Station and Hotel with gas manufactured by their patents, but in this, as in the previous case, they had to use common coal gas. The working of the Paddington Station and Hotel contract showed a small apparent profit in the balance-sheet, but the petitioner stated that such profit was made out irrespective of the cost of managing the company, and this far exceeded the profit. Moreover, the profit was only shown by neglecting to take into account the annual depreciation of the property and plant employed in the contract, which if taken would show a large annual loss to the company. In December, 1875, the company borrowed £5000, on a mortgage of all their property, at 7 per cent. interest, and on the first instalment of interest becoming due default was made. Thereupon a creditors petition was presented for a winding-up order, but before the petition was heard, the company, for certain valuable considerations given by them, procured a new lender to take an assignment of the mortgage debt and securities, and the whole property of the company now stood mortgaged to secure the debt of £5000, and an arrear of interest. The company were unable to pay such debt and interest except by means of a sale of their only remaining assets—viz., the Tunis concession and the Paddington contract. The petitioner submitted that if the company were now wound up the concession and contract might be of considerable value to purchasers competent to obtain renewals of them, which the company were unable to do for want of funds, and that a sale might be effected on terms advantageous to the shareholders. He submitted that within the meaning of the Companies Act, 1862, the company had suspended business for the space of a year, and that it was just and equitable that it should be wound up.

SATURDAY, MARCH 10.

Mr. ARMITSTEAD and Mr. HARRY GREENWOOD, appearing for shareholders and creditors, supported the petition for a winding-up order.

Mr. HEMMING, Q.C. (with him Mr. MACNAGHTEN), in opposing the petition, said the sole question, in his opinion, was whether the petition stated a case, which under the provisions of the Joint-Stock Companies Act entitled the petitioner to a winding-up order. As he opposed strictly by demurrer, his clients had not filed any affidavits, relying on the authority of the case of the *Weir Engine-Works Company, Limited*, reported in 10th Equity. The learned counsel then went *seriatim* through the paragraphs of the petition, as reported above, and submitted that the statements did not come within the provisions of the Joint-Stock Companies Act. Misrepresentation in a prospectus was not a ground for a winding-up order, proper remedies being obtainable in an action at law against the persons who made the misrepresentation, and fraudulent representations were not alleged. As he understood, the ground on which the order was asked for was, that if a company were registered with a number of objects, one of them being the most prominent, and if after registration a prospectus was issued dwelling on the face of it upon that prominent object, but mentioning on the back all the other objects, then that was a ground for saying that as soon as the prominent object of the company was abandoned, the company were incapable of carrying on business, and must be taken to have abandoned their business altogether. The 9th section of the Act of 1862 stated that "the memorandum shall contain the objects for which the company is established." When a memorandum was registered, it irrevocably defined the objects of the company, and those objects could neither be enlarged nor diminished. The objects for which the present company was formed were clearly stated in the memorandum, and also on the back of the prospectus, and the company had not departed from those objects, as was stated in the petition, because the memorandum stated that the company was formed not only for the acquisition of Ruck's patent, but for the acquisition of any gas patents in the world, oil refining, acquiring existing gas-works, to construct gas-works, to form any company for purchasing gas-works, and for various other things. Therefore, so long as the company had any possibility of carrying on gas business in any shape or way, it was impossible to say that the object for which the company was started had failed. The substratum of the petition was that the company could not carry on business after the failure of Ruck's patent; but, as he had pointed out, that was not their only object, and that being so, he submitted the petition was clearly demurrable.

Mr. WHITEHORNE appeared for shareholders holding in the aggregate about 1000 shares, and objected strongly to any winding-up order being made. He maintained that the statements contained in the petition were wholly irrelevant, and only inserted for the purpose of prejudice.

Mr. SWANSTON, Q.C. (with him Mr. GROSVENOR WOODS), appeared for Mr. Gatliff, a secured creditor for £5000, and various other creditors, and also opposed the petition. He said the creditors were perfectly content to allow the company to continue business, believing that by so doing all debts would be paid in full. The petition was filled with the grossest charges; and it was well known that those who used "black paint" needlessly, did so at the risk of having their petition dismissed with costs. It was said that the company was formed for working Ruck's patent, but the objects of the company were very much larger, and it was proved that, although they could not carry on Ruck's patent, they could carry on, and were carrying on, another business within the objects of the company. Those objects could alone be learned from the charter which was the constitution of the company. The prospectus had nothing to do with the question—the Court could only look to the Articles of Association, and read them according to the ordinary rules of construction. So doing, he contended the Court would dismiss the petition. The company were now lighting the town of Tunis and the Paddington Station; they were not doing this at a loss, and the majority of shareholders and creditors desired the company to continue business.

Sir H. M. JACKSON, Q.C., in reply, said the single point for determination was whether the business, such as it was, carried on by the company, was or was not within the Memorandum of Association. It was usual, in cases where it was suggested that improper gains had been made by the promoters, and that they objected to investigation, to find that the counsel for those gentlemen were not only instructed to declaim against the impropriety of making such assertions, but were also armed to the teeth with evidence to displace the assertions made by the petitioner. But in the present case no such evidence was forthcoming, and therefore the statements must be taken to be true.

The VICE-CHANCELLOR, in delivering judgment, said the Legislature had provided a particular code of law applicable to the case of Joint-Stock Companies, and the 79th section prescribed the circumstances in which the Court would interfere. He had no inclination to restrict the power which that clause gave to the Court, and he thought the distinction had always been clearly observed, that the Court would exercise its discretion wherever it appeared "just and equitable" that it should be done. One of the heads under which it would be "just and equitable" was where the company had suspended business for twelve months, in which case the Court would exercise its judicial discretion for the benefit of persons who invited its assistance. He had to inquire, therefore, whether, upon the allegations contained in the petition, and supported by evidence, he could make an order for winding up the company. It must be borne in mind that what had been most aptly called the charter of the company was contained in the Articles of Association; that was the contract between the parties by which the petitioner was bound as much as any other shareholder of the company. That contract was in excessively wide terms. It was said there was no case made upon the petition which would justify the Court in applying the authority of the 79th section, for there had been nothing done which was *ultra vires* of the stipulations contained in the memorandum, nor in any degree opposed to the purposes and objects of the company; nor any travelling out of the powers which, by the Memorandum of Association, were conferred. Without assuming anything that was not clearly in evidence, he thought he might say that at the time, when the project was launched, there was a notion that gas could be produced in a better and cheaper manner, by the patent taken out by Ruck, than ever before. But, although the memorandum referred to Ruck's patent, it had a much wider scope. It could easily be conceived that persons who were enamoured of Ruck's invention, conceived also that more advantageous results might be produced by some other mode. The first stipulation, therefore, described the objects for which the company was established,—namely, to acquire, by purchase or otherwise, patents for improvements in making gas for lighting and heating purposes; for making machinery and apparatus which might be deemed expedient to carry into effect any patent acquired by the company; and more especially the letters patent granted to Ruck. It was not only Ruck's patent, but any other which they might acquire, and they were to supply gas in the United Kingdom, and carry on business as oil refiners and distillers; to acquire concessions and deal with minerals and mineral oils, and sell and dispose of them upon such terms as they might think fit; and so on, showing that the objects were extremely wide. Persons had a notion that by the manufacture of gas, by Ruck's patent especially, a company should be formed with all the abundant powers which were given to them, and that was the contract which the petitioner entered into, to which he was referred in the prospectus, and by which he was unquestionably bound. The prospectus, no doubt, described Ruck's patent in very florid and perhaps extravagant terms, and pointed out the prospect of great advantage to be derived from it. Upon that, persons consented to take shares, and by the stipulations in the Memorandum and Articles of Association they were bound. The petitioners complained of many things; amongst others, the conduct of the promoters or their agents, and the manner in which the business had been carried on. If they had any right to complain respecting the manner in which the purchase-money was procured, it was not by means of a winding-up petition that they could assert that right, or urge that complaint. All they could do upon the petition was to show that the business had been suspended for twelve months, or that circumstances existed which made it discreet, just, and equitable that the Court should interfere and put an end to the partnership. The allegations of misconduct had nothing to do with the winding-up order. But it was said that Ruck's patent had entirely failed in the year 1874, and the matter was allowed to drop; that no foreign patents had been acquired by the company, and the substratum of the company was, therefore, lost before September, 1875, and had never been recovered. That word "substratum" occurred in Lord Cairns's judgment in the case of the Suburban Hotel Company. But could it be said, having regard to the stipulations of the articles, that because Ruck's patent had wholly failed, and no other patent had been acquired, the business of the company, which was described in general terms, had gone—that the substratum had failed, since it appeared that the business of making and selling gas was actually now being carried on? Then it was said that the company were endeavouring to earn profit, though without success, but not in the business for which they were formed. He could not say that the business which they were now described as carrying on was not the business for which they were formed, which was generally for the purchase, sale, and manufacture of gas. The company were, therefore, doing that for which they were formed, because they were lighting the town of Tunis and also the Paddington Station with gas. There was a suggestion that the business at Tunis and Paddington was not profitable, but if the business carried on was within the terms of the Articles of Association, that it was carried on at a loss was no reason why the Court should interfere. There was no allegation that the company was insolvent; but it was said that if the company were now wound up there would be some advantage arising to the shareholders, and that the company would now consent to a winding-up order but for the preponderating influence of the promoters. If the preponderating influence was so great, then the consequences which attended all partnerships must ensue; the partnership must go on, and the Court could not interfere. The statement in the petition showed that the company had not suspended business for

twelve months, unless the Court were to put upon the articles a construction which it was not justified in putting—namely, to hold that the only gas they could make was under Ruck's patent. He found the company were carrying on their business within the terms of the Articles of Association, that there was no case stated upon the petition which would justify the Court, under the Act of Parliament, in interfering against the will of the majority of the persons interested, to make an order which should put an end to and rescind the Articles of Partnership. The petition, therefore, must be dismissed.

DURHAM ASSIZES.—Wednesday, Feb. 28.

(*Before Justice* Lopes *and a Special Jury.*)

THOMPSON *v.* THE SUNDERLAND GAS COMPANY.

Mr. Digby Seymour, Q.C., and Mr. M'Clymont were for the plaintiff, Mr. Robert Thompson, Shipbuilder, Sunderland; and Mr. F. Herschell, Q.C., and Mr. Hugh Shield were for the defendants.

This was an action for trespass by the defendants servants upon the land of the plaintiff, and also for damage done to some of his buildings by the wilful negligence of the defendants. The plaintiff's shipbuilding yard is situated at Sunderland, and the works are built upon both sides of a public footpath, and a private cart road, which runs alongside of the footpath, which is repaired by Mr. Thompson and three other persons and which the local board wish to repair, but leave for doing so the plaintiff had refused, as the track was private property. In 1871 the defendants had a 6-inch gas-main which ran along the side of the public footway, and thence across the top of some arches in Thirlwell Road. These had originally been connected with some dwelling-houses, which had, however, been cleared off, and the arches beneath were reserved by the plaintiff for future use. The defendants, in 1871, were going to replace this 6-inch main by one double that size, and had they taken the old route of the smaller main it was contended they would not have done much damage; but they laid their 12-inch main, which was 74 feet long, within four feet of the plaintiff's yard wall, in Pottery Bank, and in making the trench they did nothing to prevent the foundation of the wall from being displaced. It was contended on the part of the plaintiff that there were two courses open to the defendants to prevent injury to the adjoining wall—viz., by underpinning the wall, or by the less expensive method of laying down the pipe in short sections. They opened up the trench by lengths of 74 feet at a time. It was open some three or four days, and the result, it was contended, was that the foundations slipped away, the wall grew dangerous, and had to be pulled down and rebuilt again, at a cost of £200 or £300. The workmen of the company, in laying down the main, had also deliberately broken off the tops of the arches, on the tops of which they had rested their main, and damage was claimed for this also, as well as for trespass on the private road.

Mr. Shield addressed the jury on behalf of the defendants, and, in the first place, contended that the road referred to as a private road was in fact the highway from Low Southwick to Sunderland, and was a public road, along which the defendants had as much right to lay their pipes as in any street of the town. He denied that there was any negligence on the part of the defendants workmen in performing the work, which was done in the best mode, and with the best materials. He denied entirely that the trench was opened its whole length of 75 or 76 feet at one time; but, on the contrary, there was never more than 27 feet open at one time. He submitted, however, that the damage could not have been done by the trench, the stiff clay in which the mains were laid being against such a supposition; and it was alleged that the bulging and cracking of the wall was observed when the work on the wall was commenced, and was due to the fall of drainage upon its base, from the higher ground upon the yard side, or from the misconstruction of it with weak materials. With reference to the injury done to the arches in Thirlwall Road, it was alleged that there were no arches met there by the defendants workmen, who only saw a couple of walls stretching across the street, the space between them being filled in by rubbish.

A considerable number of witnesses were called on both sides.

His Lordship, in summing up, placed before the jury a number of questions to answer:—1. Is the road over the arches a highway? 2. Did the defendants injure those arches in laying their pipes? 3. If the defendants acts accelerated the giving way of the wall in question? 4. Assuming that the laying of the pipes by the defendants to be lawful, had they constructed their works negligently or unskilfully on the roads in question—viz., Thirlwall Road and Pottery Bank? Lastly arose the question of damages, and in assessing these, if they found for the plaintiff, his lordship directed the jury to find two sums—one for the injury done to the wall, and the other for the injury done to the arches.

The Jury, after a short absence, found their verdict as follows:—That the road over the arches was a highway; that the defendants injured the arches; that they did not injure the wall; and that they did not do the work in a negligent or unskilful manner. They assessed the damage done to the arches at £25, but did not assess the damage done to the wall.

His Lordship said that, in fact, was a verdict for the defendants.

STRATFORD PETTY SESSIONS.—Wednesday, March 7.

Before Mr. H. F. Barclay, *Chairman, and Messrs.* Powell *and* Lister.)

BREACH OF CONTRACT OF SERVICE.

Robert Sippet, stoker, in the employ of the West Ham Gas and Coke Company, was summoned for absenting himself from work, whereby the company sustained loss to the amount of 10s.

Mr. Rawlings appeared to prosecute, and stated that the defendant had been employed by the company under a written agreement in November, 1876, as a stoker at the works, and on the 15th of February he absented himself from work, thereby causing great inconvenience. The actual loss was more than the amount named, and other men had to do double work. He further mentioned that several cases of a similar character had occurred, and the manager, Mr. Thorman, was now compelled to take proceedings, as such conduct on the part of the men was on the increase.

The Bench ordered the prisoner to pay the amount claimed and 6s. costs. Defendant paid the money.

HAMMERSMITH POLICE COURT.—Thursday, March 8.

(*Before Mr.* Bridge.)

BREACH OF CONTRACT OF SERVICE.

Several summonses were taken out at the instance of The Gaslight and Coke Company, Fulham, who claimed compensation, under the Employers and Workmen Act, from some of their stokers for leaving their work without notice. The cases against *Frederick Vince* and *Charles Hennessy* were first taken. It appeared that the defendants were absent from their work three nights without leave, and extra gangs had to be employed on Sunday to keep up the supply of gas. Vince said that other men stopped away four days, but no notice was taken of them. The foreman said they could not summon all the men who stopped away, as there were so many. Mr. M'Minn, the company's engineer, said 24 men stopped away, causing a loss of £21. Vince's defence was that he was not fit for work as he was ill.

Mr. Bridge thought the case made out, and ordered each defendant to pay £1 and 2s. costs. In large works, he added, fining men a day's pay had been found effectual.

Mr. M'Minn said he did not wish to be hard upon the men, but stopping away in that manner was most inimical to the interests of the company.

Mr. Bridge said there was no doubt that it was a breach of agreement.

Hezekiah Crowhurst was next summoned. In this case the defendant was engaged to do a night's work, but "knocked" off in the middle of it, disorganizing the whole gang.

Mr. Bridge ordered him to pay 15s. compensation, and 2s. costs. In other cases the defendants were ordered each to pay 1d., and 2s. costs.

Miscellaneous News.

METROPOLIS GAS SUPPLY.

Metropolitan Board of Works.—At the meeting on Friday last the Works and General Purposes Committee reported that their attention had been directed to the question of the charges made for testing gas-meters away from the Board's testing-places, and they had to recommend that the extra expenses incurred be in all such cases defrayed by the parties requiring their meters to be so tested, in addition to the double fees authorized by the Sales of Gas Act. The report was adopted. The communication from the Board of Trade, to which reference was made last week, was as follows:—"Board of Trade Railway Department, London, S.W., Feb. 26, 1877.—Sir,—With reference to previous correspondence on the subject of the difficulty experienced in ascertaining with certainty at what stations the gas tested at the various testing-places has been manufactured, I am directed by the Board of Trade to state that they have communicated with the agents for The Gaslight and Coke Company's Bill of the present session as to the insertion in that Bill of a clause, or clauses, dispensing with the necessity of specifying the station from which the gas is delivered, before the forfeiture to which the company may have made itself liable can be recovered. It does not appear to the Board of Trade that the difficulty to which attention has been drawn is of sufficient importance to render the introduction of a public Bill for its amendment advisable. The insertion of a clause in The Gaslight and Coke Company's Bill will remove the difficulty so far as that company is concerned; and in the case of the Commercial and South Metropolitan Gas Companies, the only other companies concerned, and whose manufacturing stations are not numerous, it appears to the Board of Trade that the difficulty, which must be but slight, must stand over for the present.—(Signed.)—Henry G. Calcraft." A report upon this communication was now brought from the Parliamentary Committee, recommending that the Board of Trade be informed that as this Board are opposing The Gaslight and Coke Company's Bill, which relates only to the sulphur in gas, the Board does not think it expedient that the Board of Trade should propose the insertion in the Bill of a clause dispensing with the necessity of specifying the station from which gas is delivered, before the forfeiture for defective illuminating power can be recovered, and that the Board are of opinion that the Board of Trade should introduce a short Bill for the purpose. On the motion of Mr. Selway the report was approved.

Dr. Whitmore's report on the illuminating power, pressure, and quality of the coal gas consumed in the parish of Marylebone during February, supplied by The Gaslight and Coke Company:—

	Illuminating Power in Sperm Candles.			Mean Pressure in Tenths of an Inch.		Mean Quanty. of Sulphur in 100 Cu. Ft.	Mean Quanty. of Ammon.in 100 Cu. Ft.	Sulphu-retted Hydrogn.
	*Mean of 22 Obser.	High-est.	Low-est.	High-est.	Low-est.	Grains.	Grains.	
Gas supplied from the Fulham works . .	16·40	17·04	15·80	21·90	8·95	16·02	0·56	No trace
Gas supplied from the Beckton and Bow works	16·18	17·11	15·50	30·18	14·48	14·04	0·50	No trace
Cannel gas supplied from the Pimlico works	20·33	21·24	18·46	19·71	12·30	16·06	0·43	No trace

Mean of daily readings of barometer . . . 29·68
" " " thermometer . . . 57·35

* Each observation consists of ten readings of the photometer, at intervals of one minute.

The mean illuminating power of the gas supplied from the Fulham works was equal to nearly 16½ candles, from the Beckton and Bow works to rather over 16 candles, and of the cannel gas to 20½ candles; the range varied from a candle to a candle and a half. The mean amount of sulphur found in 100 cubic feet of the Fulham gas was 16 grains; in the Beckton gas, 14 grains; and in the cannel gas, 16 grains. The amount of ammonia in the three gases varied from half a grain to four-tenths of a grain. The pressure of all the gases was good, and on no occasion was sulphuretted hydrogen detected in either of them by the ordinary tests.

METROPOLIS WATER SUPPLY.

The following are the returns of the Society of Medical Officers of Health, on the composition and quality of the metropolitan waters in February, 1877:—

Names of Water Companies.	Total Solid Matter per Gallon.	Oxygen required by Organic Matter, &c.	Nitrogen. — As Nitrates, &c.	Ammonia. Saline.	Ammonia. Organic.	Hardness (Clarke's Scale). Before Boiling.	Hardness (Clarke's Scale). After Boiling.
Thames Water Companies.	Grs.	Grs.	Grs.	Grs.	Grs.	Degs.	Degs.
Grand Junction	21·30	0·073	0·165	0·000	0·006	13·2	2·4
West Middlesex	20·70	0·077	0·180	0·000	0·007	12·65	3·8
Southwark and Vauxhall . . .	20·60	0·077	0·180	0·001	0·007	13·2	3·8
Chelsea	21·30	0·066	0·180	0·000	0·006	13·2	3·3
Lambeth	21·60	0·056	0·210	0·000	0·008	13·2	4·2
Other Companies.							
Kent	28·60	0·001	0·390	0·000	0·003	18·8	6·0
New River	21·70	0·049	0·135	0·000	0·005	14·3	4·2
East London	19·80	0·063	0·180	0·000	0·007	15·4	4·2

Note.—The amount of oxygen required to oxidize the organic matter, nitrites, &c., is determined by a standard solution of permanganate of potash acting for three hours; and in the case of the metropolitan waters the quantity of organic matter is about eight times the amount of oxygen required by it.

The water was found to be slightly turbid in all cases.

C. Meymott Tidy, M.B.

Dr. Whitmore's report on the composition of Thames companies and other waters supplied to Marylebone during February:—

—	In Grains, per Gallon.			In Parts, per Million.		In Degrees.	
	Total Solid Matter.	Loss by Incineration.*	Chlorine.	Free Ammonia.	Albumenoid Ammonia.	Hardness.	Hardness after boiling Fifteen Minutes.
West Middlesex	20·88	0·96	1·16	·010	·088	14·2	3·1
Grand Junction	22·48	1·04	1·21	·006	·092	15·3	3·4

* The loss by incineration represents the amount of organic and other volatile matters contained in the Imperial gallon (70,000 grains) of water.

During the month the water supplied by the West Middlesex Company, as seen through a glass tube 2 feet in length, was perfectly clear and bright; the water supplied by the Grand Junction Company was also bright and clear. The condition of the water in the Thames was very much better than in the previous month.

DOVER GAS COMPANY.

The Half-Yearly Meeting of Shareholders was held on Tuesday, the 6th inst.—Mr. W. R. Mowll in the chair.

The following reports and statements of account were submitted:—

Ladies and Gentlemen,—In order to raise the sum of £1000 mentioned in our last report as required to complete the payments in respect of the new gasholder, we sold by auction, on the 23rd of November, the remaining 200 shares created on May 10, 1876, calling up on them the sum of £5 per share. The remainder of the value of those shares, £2037 15s., will be available for working capital, as presently mentioned. The shares maintained their full increased value, selling at the average price of £15 3s. 8d. per share.

The new gasholder was brought into use in the month of November, and has been in work throughout the winter.

There has been a considerable increase this half year in the consumption of gas, and we again have the pleasure of recommending you to declare the usual dividend at the rate of 7½ per cent. per annum.

It is now our duty to state to you the arrangements we propose for the carrying on of the works after the 30th of June next, when the contract with Messrs. Anderson and Jones will expire.

We propose that the secretary's and manufacturing departments should remain distinct, as they are at present—the secretary corresponding with the shareholders, and the manager superintending the manufacture and distribution of gas and the collection of the gas-rental from the consumers, both officers being directly responsible to the directors.

Under the advice of our engineer, Mr. Kirkham, we have fixed the salary of the manager at £500 per annum, and he will be an officer of the company upon the usual terms of engagement.

As your directors, when the management and responsibility of carrying on the works devolve on them, will have a very considerable increase in their duties, it is only reasonable that they should be paid for their services in the same way that directors are paid in other companies. We have made inquiries ourselves, and have also received a report from Mr. Kirkham as to the amounts paid by way of remuneration to boards of directors of other gas companies similarly circumstanced, but we are desirous that the question should remain over till the next half-yearly meeting, when the effect of the alteration in our duties will be more apparent.

The secretary's duties will be also increased under the new system, and the amount of his salary will have to be reconsidered when the effect of such increase is seen.

We are advised that a sum of about £6500 will be required as working capital when the works come into our hands. Towards providing this sum, we propose to call up the £2037 15s. remaining unpaid upon the shares sold on the 23rd of November. And we expect to have also on the 1st of July about £2400 in hand in respect of the surplus profit accounts and of the depreciation-fund.

But beyond these two sums there will be a balance of £2000 or thereabouts required, and to meet this we recommend you to create 200 new shares of £10 each, to be sold as your directors find a necessity for the money.

A resolution will be submitted to you at the ensuing meeting, for carrying this recommendation into effect.

Engineer's Report.

Gentlemen,—I beg to report that the buildings and apparatus at your several stations have been maintained during the past half year in good repair and efficient working order. (Signed) T. N. Kirkham.

21, *Abingdon Street, Westminster, S.W., Feb.* 16, 1877.

Managers Report.

Gentlemen,—We have been enabled to supply about 9 per cent. more gas this winter as compared with last year. We provided a large quantity of cannel coal last autumn, which we have used liberally, enriching the gas 25 to 30 per cent. in excess of the parliamentary standard.

Since the new purifiers have been in use there have been no complaints of nuisance.

The mildness of the winter and the stoppage of the traffic on the South-Eastern Railway between Dover and Folkestone have checked the sale of coke.

One-fifth of the retort-house has been idle this winter.

Dover, Feb. 6, 1877. (Signed) Anderson and Jones.

Dr. *Cash Account for the Half Year ending Dec.* 30, 1876. *Cr.*

Receipts.				Payments.			
Balance brought forward	£1,273	14	10	Dividend	£1,762	10	0
Of managers on account of rental	2,213	6	3	Rates and taxes	404	15	8
New shares	2,320	0	0	Interest on loans	247	18	2
Premium on ditto	1,000	0	0	Chandler, for purifier gear	158	5	0
Scrip for ditto	5	0	0	Salaries	88	11	0
				Law expenses	73	12	4
				Petty cash	27	19	0
				Rents	5	0	0
				Directors fees	200	0	0
				Jennings, for valves	18	0	0
				Cutler and Son, on account of gasholder	1,732	16	0
				Stiff, on account of tank	1,700	0	0
				Walker, balance for purifiers	130	10	0
				Terson and Son, sale of shares	13	17	0
				Balance	248	6	11
	£6,812	1	1		£6,812	1	1

Revenue Account.

Anderson & Jones, for manufacture of gas, &c.	£5,965	2	5	Discount over-estimated last half year	£9	9	8
Lighting and cleaning lamps, &c.	209	5	0	Rental for half year	8,190	2	8
Balance	3,301	13	5	Public lamps	1,276	8	6
	£9,476	0	10		£9,476	0	10

Profit and Loss Account.

Rates and taxes	£399	15	2	Balance of revenue account	£3,301	13	5
Salaries	88	6	0	For scrip	5	0	0
Law expenses	42	4	2				
Petty cash	33	8	3				
Rents	5	0	0				
Depreciation	334	2	6				
Interest on debentures	246	17	9				
Balance	2,156	19	7				
	£3,306	13	5		£3,306	13	5

Balance-Sheet.

Old capital converted into stock	£21,945	0	0	Amount expended on permanent works	£70,409	18	3
New Shares Act of 1860	18,055	0	0	Managers	3,301	13	5
Ditto, 1864	9,820	0	0	Bankers	248	6	11
Statutory mortgages	10,000	0	0	Ditto on deposit	1,200	0	0
Sundry liabilities	522	0	5				
Premium on new shares account	1,983	12	9				
Surplus profits	3,721	10	1				
Depreciation account	6,955	15	9				
Balance of profit and loss	2,156	19	7				
	£75,159	18	7		£75,159	18	7

The Chairman, in moving the adoption of the report, said: The shareholders will notice in the first clause that when we wanted to raise the sum of £1000 to complete our payment in respect of the new gasholder, 200 new shares were created, and we called up on them a sum of £5. The remainder of the value of these shares we reserve as working capital, which we shall want by-and-by. It must be exceedingly gratifying both to the board and shareholders to know that the £10 shares maintained the full increased value to which they have risen within the last few years, and that they realized an average price of £15 3s. 8d. The new gasholder was brought into use in November, and has been in use throughout the winter. There has also been a considerable increase in the consumption of gas during the past half year. That of itself is very gratifying, but even without that we should have been in a position to pay the usual dividend of 7½ per cent., which we have been paying now for some few half years past. We can pay it this half year grandly, without having to sweep up the corners of our earnings for the purpose. It is also stated in the report that our arrangements are made for taking the works into our management on the 30th of June next, when the contract with Messrs. Anderson and Jones will expire. It is with no little pleasure I inform you that all the negotiations, so far, have been carried on in the most satisfactory way. Messrs. Anderson and Jones will be dealt with in a liberal way in taking over the plant they leave on the works, and we have every reason to think that when the 30th of June comes, and the town is lighted on the 1st of July with gas made under our own direct management, the town will be thoroughly well satisfied. Our proposals are these—the secretary's and the manufacturing departments will remain distinct, the secretary corresponding with the shareholders, and the manager superintending the manufacture of gas and the collection of gas-rental, both officers being directly responsible to the directors. By the advice of our engineer, Mr. Kirkham, we have fixed the salary of Mr. Jones at £500. He will be an officer of the company on the usual terms of engagement. As I said before, I have great pleasure in saying again, that, looking at the large stake Mr. Jones and his family have in this company, we felt that instead of going into the market and endeavouring to get a manager at the lowest possible salary, it was due to Mr. Jones that we should make him a liberal offer. We did so. Mr. Jones accepted it in the same liberal spirit, and we all cherish the earnest hope, and I may go further and say a full confidence, that we shall work amicably together. The report goes on to say: "As your directors, when the management and responsibility of carrying on the works devolve on them, will have a very considerable increase in their duties it is only reasonable that they should be paid for their services in the same way that directors are paid in other companies. We have made inquiries ourselves, and have also received a report from Mr. Kirkham as to the amounts paid by way of remuneration to the boards of directors of other companies similarly circumstanced." We had two objects in taking this course. The one was that we did not want to fix the amount of our remuneration on any mere rule of thumb. We claim, as all other boards of directors claim, that taking the responsibility and the anxiety of managing a large company such as this, it is only right that we should be paid. On the other hand, the amount of time and attention it will be necessary to bestow has yet to be discovered by us. Further, then, we cherish to ourselves the conviction that the gas in the future will be at least as economically made as it has been in the past. We also expect that we shall be enabled to give an article of a higher illuminating power, and these things will involve probably more expense than at the present moment we are aware of. We were most anxious that the shareholders should not suppose we had any intention of asking for a salary for ourselves till we had established the fact that the salary had been earned. I may put that line of thought in other words, and say—I must, perhaps, be a little cautious in the way in which I put it—our present conviction as a board is this, that we would sooner not receive one farthing for our services than be paid by any diminution in the dividend earned by the working of the company. Now, we wish this to be distinctly understood, because I think perhaps one or two of the shareholders had a notion that we wanted to pay ourselves first and see after our brother shareholders afterwards. As the mouthpiece of the board, I venture to say that such a conviction does us an injustice. We want first to keep this company in the prosperous condition in which we find it at this moment, and if we succeed in doing that, we shall ask the shareholders to pay us fairly for our services. The secretary's duties will also be increased under the new system, and the amount of his salary will have to be considered. As to the last clauses of the report, if it should so turn out that we only want £500, we shall only raise £500; but in order to be in the financial position a large company like this ought to be, of having plenty of ready money to go into the market and purchase our goods for cash, and so on, and get the full benefit of discounts on our contracts on the most favourable terms, we ask this afternoon for power to raise an additional capital of £2000. Now, that is just an elaboration of what the report which you have heard says. I desire further to add, that the directors do not anticipate conducting this company upon mere common sense. They intend to avail themselves of the highest professional skill which the gas world affords, and having the benefit of that professional skill, they will apply their own common sense, and then we hope we shall be like the skilful navigator when his compass is all right, and shall continue to sail the ship of this company into harbour, to give satisfaction to the consumers of gas, and bring the full dividend to the shareholders. I beg to move that the report of the directors be received and adopted, and a dividend at the rate of 7½ per cent. be declared.

Mr. Bottle seconded the motion, expressing his conviction that the company were in as good a position as any in Kent.

The motion was carried unanimously.

The Chairman next moved—"That 200 new shares of the company, each of the nominal value of £10, be and the same are hereby created."

Mr. Stone seconded the motion, and it was agreed to.

This concluded the formal business.

Mr. Jones said his modesty had kept him in his seat, as he had hoped that some other shareholder would have risen to propose a vote of thanks to the chairman and directors for their services. He should be happy to submit a motion to that effect.

Mr. Druce seconded the motion, which was carried.

The Chairman, in reply, said that, speaking for his colleagues, he would say it afforded him great pleasure to receive this vote of thanks. They

could not shut their eyes to the fact that the company were now in a position of great prosperity. A very few years ago the shares only realized a small premium, something like 2s. 6d. a share.

The SECRETARY (Mr. G. Fielding): They were sold without any premium for a long time.

The CHAIRMAN said that for some time the shares stood in the market at par, but now they were at 50 per cent. premium. This was a very satisfactory result, but it had not been arrived at by any mere rule of thumb. It was really the result of several things that had taken place at the board, of which the outside public knew nothing. So far as they could speak with reference to the future, they could say that the dividend of 7½ per cent. would be continued. Again, for several months past there had been no complaints of any nuisance arising from the manufacture of gas, and hence they drew the inference—they hoped a fair one—that it had been reduced to a minimum, and was consequently, in the eye of the law, no nuisance whatever. The price charged to consumers was as low as in any town in the immediate neighbourhood; and, all these things considered, the directors felt highly pleased by the vote, believing that the shareholders were only giving them what they were entitled to. They trusted in the future they would continue to enjoy their full confidence in the management of the company.

The proceedings then terminated.

STOCKPORT CORPORATION GAS SUPPLY.

At the Meeting of the Stockport Town Council on the 1st inst.—the MAYOR (Mr. H. Bell) presiding,

The minutes of the Gas Committee were brought up and read. The committee recommended that the price of gas inside the borough be reduced from 4s. to 3s. 7d. per 1000 for consumption under 500,000 cubic feet, and 3s. 6d. per 1000 exceeding 500,000; outside the borough, that the price be reduced from 4s. 8d. to 4s. 3d. per 1000 under 500,000, 4s. for over 500,000 and under one million, and 3s. 11d. over one million. These reductions to take effect from Jan. 1 last.

Alderman WILKINSON moved, and Alderman PEARSON seconded, the adoption of the minutes.

Mr. BROWN asked whether he understood that there was a further reduction to large consumers under the new arrangement.

Alderman WILKINSON said the discount to large consumers was reduced.

Mr. BROWN said he and others in the council thought this was a very large and liberal allowance made to the general public, and the price ought to be the same all round. There was no reason why there should be a further reduction of a penny because certain parties happened to consume large quantities. The gas cost a certain sum per 1000 to make it, and they could afford to sell it at a certain price. No doubt the Gas Committee had carefully decided on the price—that is, 3s. 7d.—and why should they go further than that, and allow a penny to large consumers? There was an advantage given to the large consumers which they were not entitled to. Therefore he proposed that the minutes pass with the exception of that relating to reduction in the price to large consumers.

Mr. THORNILEY said he took the same view as Mr. Brown, and would therefore second the motion.

Mr. HOPE thought it a very unwise thing to alter the decision of the Gas Committee. They had come to a very careful conclusion as to what could be done in the way of reducing the price. It must not be forgotten that, last April, when the matter was under discussion, the discount to large consumers at that time was 4d., and it was reduced to 2d. Although it was the practice in some towns—such as Oldham and Manchester, and Bolton, he believed—not to make any reduction at all, still he knew some large consumers in the borough felt it to be a great grievance in having the discount altered on the last occasion. As there was some little saving in the way of collecting the accounts, he thought the penny in this instance would not be giving the large consumers too much. He thought the minutes should be allowed to pass.

In reply to Alderman Nield, it was explained that the discount of 1d. was allowed on all the gas consumed by those who took over half a million feet, and not alone on the quantity above that amount.

Mr. PARKES held that the prices were based on a fair commercial principle. It was the custom in all commercial circles for large consumers to have goods at a less cost than small consumers. He thought the Gas Committee were enabled to save a large sum for the small consumers in purchasing large quantities of cannel, and, as Mr. Hope had stated, the cost was less for collecting from large consumers, and there was less waste and risk. They lost a large sum of money with the small, and very little with the large consumers. Therefore he thought the discount was a just principle to go upon.

Mr. NELSTROP: How many consumers in the town get this benefit?

Alderman WILKINSON: I cannot tell you in the borough; there will not be a very great many. I did not expect the question to be asked, and, therefore, have not the particulars.

Alderman PEARSON contended it was a reasonable thing that a mill-owner whose gas bill came to £300 or £400 a year should have some compensation for paying from the meter, or from the time it entered his premises; for by the pipes traversing yards, and going from one place to another, there was leakage.

Alderman WILKINSON, in reply, said the question had been fairly well considered in committee time after time, and he must decidedly object to the minutes being referred back.

Mr. BROWN, in response to the request of several members of the council, withdrew his amendment with the consent of the seconder, and the minutes were passed.

HEREFORD CORPORATION GAS SUPPLY.

At the Meeting of the Hereford Town Council, on Thursday, March 1—the MAYOR (Mr. Ralph) presiding,

The Gas Management Committee presented their annual report, of which the following is the principal portion:—

The accounts for the year ending the 31st of December last, as made up by Mr. Capner, we lay before the council. In addition to the information therein contained, we give the following comparative statement showing the results of the working under different heads:—

	For Year ending Dec. 31, 1875.	For Year ending Dec. 31, 1876.
Coals carbonized	4,964 tons.	5,123 tons.
Gas produced	51,318,000 feet.	53,629,000 feet.
Gas lost or unaccounted for	5,936,133 ,, or 11·54 p.c.	5,683,326 ,, or 10·59 p.c.
Average make of gas per ton of coal carbonized	10,337 feet.	10,466 feet.
Maximum quantity made in 24 hours	268,000 ,,	282,000 ,,
Maximum quantity delivered in 24 hours	296,000 ,,	293,000 ,,

The average illuminating power of the gas during the past year has been equal to 14·33 standard sperm candles, consuming at the rate of 120 grains per hour in comparison with Sugg's new "London" standard Argand burner, consuming 5 cubic feet of gas per hour.

Having reference to the result arrived at by the auditor, that a sum of £4892, gross profits, was made during the year, and that a sum of £3504 remained after paying the interest on the mortgage debt, coupled with the fact that a contract has been made for the supply of coal at a reduced price, we think the time has arrived when some reduction may be made in the price of gas. We, therefore, recommend that a reduction be made to the extent of 6d. per 1000 feet in respect of the supply to the public lamps, and 3d. per 1000 feet in respect of the supply to private consumers, provided payment be made within six weeks after the commencement of each quarter.

The following is the report of Mr. Capner, the auditor, above referred to:—

"*Hereford, Feb.* 26, 1877.

"Gentlemen,—In accordance with your instructions, I have examined and audited the accounts connected with the management of the gas-works for the past year, and herewith beg to hand you statement of same. In their preparation I have endeavoured to follow the method previously adopted, so as to facilitate references and the comparison of details with those of the previous year. You will be gratified to learn that the business has been conducted at a considerably increased profit, a result which must give satisfaction to the citizens generally. The rental has been increased by about £500, and this, coupled with the large reduction in the price of coal, has mainly conduced towards obtaining this result. With the accounts before you I need not here enter further into detail, but will simply quote the increased profit and the surplus balance carried forward to new account, 1877, viz.:—

Profits for 1876	£4892 8 0	Surplus balance, 1876	£2405 7 9
,, 1875	3841 8 3	,, 1875	976 18 10
Increase	£1050 19 9	Increase	£1428 8 11

"With regard to the method of keeping the accounts, I would venture to suggest that, as soon as practicable, the expenditure book should be so extended as to include items disbursed on capital account, with a view to obtaining a complete record of all payments made during the year. In addition to this I consider it desirable that some system of balancing half yearly should be adopted, and that the office staff prepare and furnish a statement of their transactions for the periods ending the 30th of June and the 31st of December in each year. I am informed that this plan is now in general practice by gas companies, and I think commends itself to all connected with accounts of a complicated nature. My acknowledgments are due to your manager and his clerk for their courteous assistance during my investigation. (Signed) J. W. CAPNER.

"The Committee, Corporation Gas-Works, Hereford."

Dr.—Capital Account, Dec. 31, 1876.

To Loan, 1872, repaid to July 6, 1875	£2,828 2 8	
Do. 1872, ditto July 4, 1876	1,028 15 11	
		£3,856 18 7
Do. 1875, ditto ditto		50 0 0
		£3,906 18 7
Balance unpaid		52,593 1 5
		£56,500 0 0

Cr.—Capital Account.

By Cost of works and expenditure to Dec. 31, 1875	£55,716 8 4	
Amount subsequently expended	55 7 2	
	£55,771 15 6	
Less abatement on account of mains £39 3 7		
Less sale of old materials 20 0 0		
	59 3 7	
		£55,712 11 11
Balance of capital account		787 8 1
		£56,500 0 0

Dr.—Profit and Loss Account.

To Coals consumed, cost	£3,569 18 11	
Purifying	112 13 5	
General repairs—wear and tear	638 12 3	
Repairs to mains and services	16 11 3	
Lamp lighting and repairs	192 18 1	
Gas-making wages	636 3 5	
		£5,166 17 4
Salaries	£340 0 0	
Rates, taxes, and insurance	467 7 11	
Stationery, printing, &c.	38 8 2	
Law expenses	0 18 6	
		846 14 7
Total expenditure		£6,013 11 11
Net revenue account, for balance transferred		4,892 8 0
		£10,905 19 11

Cr.—Profit and Loss Account.

By Gas-rental, for public and private lights for 12 months, Dec. 31, 1876		£9,755 5 6
Residual products, less cartage and expenses, viz.—		
Coke	£695 18 2	
Tar, liquor, &c.	334 4 5	
		1,030 2 7
Fittings account, profit thereon		73 0 7
Abatements		47 11 3
		£10,905 19 11

Dr.—Net Revenue Account.

To Interest paid on mortgage to June 30, 1876		£1,161 15 4
Ditto accrued and owing to Dec. 31, 1876		1,136 6 9
Ditto paid on additional loan of £1500	£32 4 8	
Ditto ditto ditto	31 0 7	
		63 5 3
Ditto charged by treasurer	£8 18 2	
Less allowed on deposit account	5 2 4	
		3 15 10
Capital account for sale of old materials		20 0 0
Loan redemption-fund, for balance transferred to credit account		1,078 15 11
		£3,463 19 1
Balance, surplus, to new account		2,405 7 9
		£5,869 6 10

Cr.—Net Revenue Account.

By Balance brought from last account	£976 18 10
Ditto ditto profit and loss account, being profits for twelve months to Dec. 31, 1876	4,892 8 0
	£5,869 6 10

Dr.—Loan Redemption-Fund.

To Cash paid—	
Instalment on loan, 1872	£1,028 15 11
Ditto ditto 1875	50 0 0
	£1,078 15 11

Cr.—Loan Redemption-Fund.

By Net revenue account, amount transferred	£1,078 15 11
	£1,078 15 11

Dr.—General Balance-Sheet.

To Capital account for balance unexpended		£787	8 1
Sundry tradesmen and others, amounts due for coals, fittings, &c.		643	12 9
Interest accrued and unpaid on mortgage to Dec. 31, 1876		1,136	6 9
Amount due to treasurer		155	4 9
	£2,722	12	4
Net revenue account, balance at credit	2,405	7	9
	£5,128	0	1

Cr.—General Balance-Sheet.

By Amount owing by debtors for gas and meter rental, including the quarter's rental ending Dec. 31, 1876.	£2,872	6	2		
Less deposits received	£12	10	0		
Less paid in by collector	1	0	1		
	13	10	1		
				£2,858	16 1
Debtors for residuals, viz.—					
Coke	£401	4	2		
Tar	120	9	2		
Lime	12	0	0		
Liquor	30	7	6		
Fittings	286	0	5		
				850	1 3
Stock of materials on hand, Dec. 31, 1876, viz.—					
Coals	£289	5	0		
Fittings and general stock	525	7	9		
Purifying materials	6	10	0		
Coke	30	4	6		
Tar and ammonia	20	0	0		
Gas	10	11	6		
				881	18 9
Cash on deposit at bankers				500	0 0
Cash in hands of manager				37	4 0
				£5,128	0 1

The CHAIRMAN moved the adoption of the report, and congratulated the council on the satisfactory result of the last year's operations. The profit realized was so handsome that the committee felt justified in recommending a reduction for the March quarter to private consumers of 3d. per 1000 feet, and of 6d. per 1000 feet in the public lamps. That was exactly one-half the increase made by the corporation when they became the owners of the gas-works. At that period a discount of 6d. per 1000 feet was taken off for private customers; the lamps were charged 3s. per 1000 feet, and the public 4s. The lamps were now charged 3s. 6d., and to private consumers the rate would be 3s. 9d. The committee would incur a loss of £700 by this step, but they felt that they would have left a pretty good margin. It was clear they must shortly incur considerable expenditure in increasing the works, to meet the constantly increasing demand for gas. They did not, therefore, think it desirable to make any further reduction in the price of gas at present; but they hoped that, perhaps by the end of the year, they might be able to go back to the original price, and give the full discount of 6d., as was the case when the corporation took the works. From a calculation of what the cost for coal had been since the corporation had taken the management of the works, he found that there had been an average increase of something like 50 or 60 per cent. He thought, therefore, that everybody would be highly gratified by the result presented in the report. The city was benefited last year to the extent of £2500 by the gas-works, for a profit had been realized on them of between £1400 and £1500, and nearly £1160 had been paid off the principal.

Mr. JAMES, in seconding the motion, said he had always contended, and he believed the principle was now thoroughly admitted, that it was the duty of the Gas Management Committee to charge a fair commercial price for gas, and to do it independently of any result which might follow on the finances of the city. When they recollected the price paid for the works when they were purchased by the city, and that that proceeding was sanctioned not only by a large majority of the board, but by a large majority out of doors, there was no need to question whether in the purchase they gave a fair price for the works or not. The gross profits last year amounted to between 8 and 9 per cent. on the amount invested, and it must be remembered no allowance had been made for a depreciation-fund, which, if the works were in the hands of a private company, would be necessary. If they made that reduction, they were earning on their capital something between 7 and 7½ per cent. Looking at the matter from that point of view, he did not see that the purchasers could say that the money was badly invested when they got 7½ per cent. on their money; that was to say the money being borrowed at 4½ per cent., there was a clear profit of 3 per cent. He did not think any one, investing his money as he would, could expect anything better than that. The Legislature, as they knew, had said the makers of gas might get, if they could, as much as 10 per cent.; 7½ per cent. could not, therefore, be an unreasonable sum to obtain from the consumer. Viewed in that light, he thought it might fairly be said that justice had been done to both parties—the purchaser and the consumer. If the reduction in the price of coal continued, the committee hoped to further reduce the price of gas, and were very anxious to take the matter into consideration, and see what further reduction, if any, could be made. He wished it not to be understood that he was sanctioning the holding out of any reduction, for considerable expense they would, perhaps, have to meet stared the committee in the face. He hoped, however, the gas consumers would be satisfied with the small mercies that had been meted out to them.

Alderman ANTHONY: On what principle do you make a distinction in the reduction of 3d. to the private consumer, and 6d. on the public lamps?

The MAYOR said they were increased 1s. in the first instance, and half the charge had been taken off each.

Alderman ANTHONY asked for a return of the prices of the different tenders that had been sent in. He noticed that they were not inserted in the report, and he moved that a return of the tenders be presented to the board. He wished to know likewise why the committee had entered into a two years contract for coal at 7s. 4d. per ton. He thought that was a very ill-advised step in the face of a falling market. It was just possible that a tender might have been obtained at 6d. per ton less.

The MAYOR said there was no objection to the tenders being published with the report, but it was an unusual proceeding, and not adopted with the other committees. In entering into a contract for a two years supply, the committee felt that that was the best thing to do under the circumstances, for they did not think it likely that coal would be much cheaper, and the price was certainly the lowest at which they had ever been able to enter into a contract. The price could not possibly be much lower, and there was a probability that it might be much higher. It was a fluctuating contract, subject to the rise and fall of wages.

Mr. SHELLARD fully concurred in the course recommended by the chairman, the Mayor, and which met with the general approval of the committee. It was thought, too, that coal would not much decrease in price, and so a two years contract was entered into. Whether they had taken this step rightly or wrongly the result would determine.

Alderman ANTHONY: From my observation, we could well retard the lighting of the lamps at least half an hour. The lamps are lighted in the public streets half an hour before twilight.

Mr. LLANWARNE, That's a question for the Lighting Committee, not the Gas Committee.

Alderman CAM was very glad to find that at last the Gas Committee were agreed to give a little bonus to the consumers, because, in his opinion, they ought to have been considered first of all, and the committee appeared to have considered them last, They ought to receive the greatest reduction. He believed the council had already increased the salaries of almost all the officers connected with the gas-works, and now they were going to benefit the ratepayers by reducing the price of gas 6d. for the public lamps, and at the fag-end they took off 3d. for the consumer's benefit. Legally the consumer should be first considered. Some hope was held out that at the end of the year the committee might give a further reduction, and he hoped their forecasts would come true. He, like Alderman Anthony, had observed the mode of lighting the street-lamps, and he was perfectly satisfied that between the lighting and extinguishing, at least three-quarters of an hour might be saved. Very frequently he saw, in his own street, gas blazing away in full sunlight, and it was often the case that he met men returning from lighting the lamps over Ailstone Hill and Hampton Park at a time when they ought to be beginning the work. He was perfectly satisfied that three-quarters of an hour might be saved in the four-and-twenty hours.

In reply to a question, Mr. DAVIS, the gas manager, said he did not think it was twelve months since the list of times for lighting was last revised.

Alderman ANTHONY: In consequence of that revision I have taken particular notice of what has occurred during the last six months, and I am certain that, although perhaps you might not extinguish them earlier, you need not light them so soon.

The MAYOR said the Gas Management Committee were not responsible for the time at which the street-lamps were lighted and extinguished, and he might perhaps be permitted to say, too, that the highly satisfactory result obtained by the Gas Committee last year was in no small measure to be attributed to Mr. Davis, the manager, and to the way in which the accounts were collected. Mr. Cam had observed that the servants connected with the gas-works had had their salaries raised, and that the last persons considered had been the private consumers. In reference to that remark, he begged to say that the salaries paid at the Hereford Gas-Works were less than those paid at any other gas-works he knew of.

Alderman CAM said he had not mentioned the subject with any intention of finding fault, but had merely called attention to it as a fact.

The MAYOR, continuing, said that Mr. Davis had certainly obtained better results than had been obtained at other gas-works, and they were indebted to him and the other officers to no small extent for the profit they had made. Mr. Capner had stated to him that in the arrears there was scarcely a difference of £5 from last year. With reference to the reduction of 3d. only to the private consumers, taking the price off the public lamps really amounted to much the same thing as reducing the charge to the private consumers, inasmuch as the taking 6d. off the public lamps would probably be the means of preventing a city rate being required, and the private consumers would have to pay to a city rate.

Mr. JAMES: How about those who do not consume gas? That would be a very different thing.

The MAYOR: But the principal ratepayers do consume gas.

Alderman CAM: We ought not to work our gas-works or water-works with the intention of getting a surplus. The first thing is to give the consumers a reduction before you relieve the ratepayers.

Mr. LLANWARNE apprehended that Alderman Cam's principle could hardly be worked out logically. The property belonged to the ratepayers, and was paid for with the ratepayers money. Legally, of course, everybody was entitled to look after himself first, and the ratepayers duties first related to themselves, and it would appear that the committee had accordingly first looked to themselves—that was to say, to the interests of the ratepayers.

After some further conversation, the report was adopted.

On the report of the Lighting Committee being brought up,

Mr. GRUNDY urged that an alteration be made in the present mode of lighting the lamps, and that the burning of the gas on bright moonlight nights be obviated. As a heavy ratepayer—perhaps the heaviest in the room—he thought something should be done to check this wasteful expenditure.

Alderman ANTHONY advised Mr. Grundy to leave the matter in the hands of the committee, and promised that he himself, as chairman of the committee, would take care the subject should be dealt with.

Alderman BOSLEY moved the adoption of the report. He said perhaps Mr. Grundy was not aware the subject had been before the board over and over again, and the question had frequently been considered by the council. But they had to govern the lighting of about 500 lamps, and it could hardly be expected that uniformity in their lighting and extinguishing could be arrived at. Nights so bright as the previous one did not often occur.

Alderman ANTHONY seconded, and expressed his intention to bring the subject before the committee.

Mr. SHELLARD did not wish a one-sided impression of the discussion to go forth to the public. Hitherto the statements that had been made had been calculated to create an impression that the council had been for a series of years wasting the property of the ratepayers by allowing the lamps to burn on moonlight nights. He could hardly go back to a period in the history of the council when this subject had not again and again cropped up and been considered and re-considered in all its bearings. Did time permit, a number of reasons could be furnished, by which it could be shown that the great saving Mr. Grundy anticipated would follow from a change in the mode of lighting the lamps was more apparent than real, for there were a great many set-offs and drawbacks to be taken into account. No doubt the committee would give the subject every consideration, and he trusted they would take into their counsels, not only their own private judgments, but those also of the surveyor and gas engineer.

The report was adopted, it being understood that the chairman would introduce the question shortly.

ABINGDON GASLIGHT AND COKE COMPANY, LIMITED.—The fourteenth annual general meeting was held on the 1st inst. The report and balance-sheet showed such satisfactory results of the past year's operations as justified the recommendation of a 10 per cent. dividend, payable on the 22nd inst. Votes of thanks were unanimously passed to the board, the chairman, E. S. Copeland, Esq., and to Mr. John Ely, the secretary and manager.

DERBY GAS COMPANY.—The half-yearly meeting was held on the 28th ult., when the usual dividend of 10 per cent. on the original shares, and 7 per cent. on the new shares was declared, after payment of which there was a balance of over £1500 to be carried forward. The directors were authorized to dispose of the Traffic Street premises of the company. After the ordinary business, the meeting was declared "special," and a resolution to make a further call of £6 5s. on the new shares was agreed to.

COLERAINE (IRELAND) GAS-WORKS.

The following is the substance of a Report by Mr. T. Newbigging, Consulting Gas Engineer, Manchester, recently presented to the Commissioners of Coleraine on the condition of the gas-works, which are the property of the town:—

Gentlemen,—Agreeably to your instructions, I have made a careful examination of your gas-works, and the general circumstances of the supply of gas to Coleraine. I beg to report as follows:—

The retort-house floor being below the flood level of the river adjacent (the Bann) is disadvantageously situated for the economical production of gas. It is invariably flooded once a year, or oftener, the water at times rising sufficiently high to extinguish the furnace fires, the consequence being the sudden formation of a large volume of steam filling the benches and penetrating the brickwork.

This, in addition to the difficulty of maintaining the supply of gas, cannot but prove less or more injurious to the iron retorts and their settings, and quite prevents your having recourse to the use of clay retorts in the present house, as the first occurrence of a flood of this character would prove utterly ruinous to the whole of such retorts that might be at work at the time. Besides this, there is a constant lodgment of water underneath, and in the foundations of the benches, causing the consumption of an excess of fuel to evaporate the moisture which is always present, and maintain the heat of the retorts.

The retort-house is only in an indifferent condition. The roof is composite in character, being constructed partly of wood and partly of iron. The employment of timber here is objectionable on account of the risk of its destruction by fire.

The retort stock is not in good condition. In the depth of winter, when the consumption of gas is greatest, the whole of the retorts are required to be at work; but this is owing to inadequate storeage room for gas in the holders.

I recommend the erection of a new retort-house with wrought-iron roof, on the higher vacant land belonging to the Commissioners, adjoining the present works, out of reach of the periodical floods of the Bann. Space should be left for the extension of the building as required in the future. I recommend the adoption of clay retorts as being entirely suited to your purpose. Their first cost is less than the iron ones; they are more durable, and being capable of standing a greater heat, will produce more gas per ton of coal carbonized.

The condensing arrangements are very inadequate. There is neither scrubber nor washer, and the gas passes to the purifiers, and even into the holders and mains, charged with particles of tar, clogging the lime contained in the purifiers, rendering it impossible to purify the gas satisfactorily, besides materially increasing the cost of such imperfect purification as is effected.

I would not advise that the present condenser, which is of the battery or organ form, be dispensed with, but that it be put in proper repair, and that its use should be supplemented by the erection of an additional condenser.

The purifiers are about adequate in size, but badly arranged, and the water-lutes for the covers much too shallow. They should be 18 inches deep at least.

The gasholder-tanks and holders are in satisfactory condition. The storeage room for the gas, however, is deficient to the extent of 45 per cent. of the day's production. The effect of this is to cause more retorts to be kept at work than are required under normal conditions, in order that the supply of gas for the night, which the present holders are unable to afford, may be maintained. In the daytime some of the retorts are frequently standing off uncharged, because the holders are incapable of containing all the gas they could produce during the day; and as the heat has to be maintained notwithstanding, there is a constant waste of fuel (coke with you is worth 20s. per ton, and this is a serious consideration), wear and tear of retorts, and extra labour required; all of which, with sufficient storeage capacity in the holders, might be obviated. Another holder is required for economical working.

Station-meter and governor are in effective working condition.

In the absence of a plan of the street-mains, I could only form an estimate of their length by going over the whole district. Their diameter ranges from 8 inches down to 1½ inch. The use of mains of the small diameter of 1½ and 2 inches is extremely objectionable, and is rarely resorted to in well-conditioned gas-works. It is an unfortunate circumstance for Coleraine that they were so extensively adopted by the first engineer of the works. Their cost in laying, in proportion to the diameter, is heavy. The size of the joint bears a very large proportion to the area of the pipe, increasing the risk of leakage. They are easily fractured, and, when drilled for the insertion of service-pipes, are so weakened at those points as to be liable to break and cause escape of gas. In addition to that, a heavy pressure has to be maintained to force the gas through them during the hours of supply, the result being a considerable loss by leakage. The service-pipes are of wrought iron, and range from ½ inch diameter upwards. A large number of these have been in use for many years without renewal. I recommend, in all cases where such small pipes exist in any of the streets of the town, that they be taken up and replaced by pipes of larger diameter, not less than 3 inches diameter for the mains, and ¾ inch diameter for the services, and larger as the exigencies of the consumption may require.

The meters in use are generally of the wet description. The wet are preferable to the dry, save under exceptional circumstances. I recommend that you should make a thorough and careful inspection of the meters. Every one of these, without exception, should be disconnected and cleaned with fresh water repeatedly poured into them and out again. This can be done without taking the meter to pieces; but whenever a meter is found to have been long in use (say over ten years), or defective in any way—or when there are more lights supplied through it than the size of the meter fixed is intended to supply—it ought to be replaced by another in good condition and of the proper size. The whole of the meters should be inspected and watered, if required, twice during each quarter.

I observed, during my visit of inspection, that you have the common iron burner very generally in use. I would advise you to get a supply of various suitable burners from approved makers (names of makers and description of burners are given), and distribute them freely amongst the consumers, or offer them for sale at a merely nominal charge. You will be astonished at the improvement they will effect in the general lighting.

There is great irregularity in the public lamps. Some of them consuming quite 6 or 7 cubic feet per hour, and yet affording but an indifferent light. A governor should be affixed to each; this would improve the light and reduce the consumption. The lamps are of tinned iron plates. This is false economy. They are constantly in need of repair, owing to their rapid decay by exposure to the weather; lamps made of sheet copper, tinned over, are much to be preferred. The old system of lighting by means of a ladder is in use. You should adopt the lighting-rod. It enables a man to do the work more expeditiously, and with greater ease, besides getting rid of the danger of accident attending the hurrying through the streets at dusk with a ladder.

In the absence of a photometer, I estimated the illuminating power of the gas to be about 15 or 16 candles, which is very satisfactory, taking into consideration that no cannel, but only the ordinary gas coal, is used. The gas was free from sulphuretted hydrogen, but ammonia was present in very large proportion. I have explained how this latter impurity may be removed.

Your unaccounted-for gas, as near as I could ascertain from the figures furnished to me, is about 24 per cent. of all that is produced. This is much in excess of what it ought to be. There need be no difficulty in a place like Coleraine, advantageously situated as it is for lighting, in bringing it down to 10 or 12 per cent. It arises from several causes. These are principally as follows:—

1. Owing to a want of adequate condensing power, the gas in winter, when the make is heavy, passes through the apparatus without being sufficiently reduced in temperature, and in this state it is measured by the station-meter into the holders, where, and in the street-mains and services, it undergoes subsequent condensation or contraction of its bulk. This is not an actual loss of gas; but it shows a larger make per ton of coal than is really the case, and the distribution suffers at the expense of the production.

2. The pressure in the mains, both in the daytime and during the hours of consumption at night, is heavier than is necessary under proper conditions of supply.

3. I have already alluded to the inadequate size of the great bulk of your mains. They are a fruitful source of loss, for the reasons I have explained. But it is to the renewal of the wrought-iron service-pipes you must look for a material reduction in your present leakage. The porous nature of the soil in which the pipes are embedded tends to hasten their decay. I strongly recommend that you should at once systematically set about the renewal of all service-pipes that have been in the ground for more than six years. Do not let any question of expense prevent this from being done immediately; the result will amply repay you for the outlay that will be incurred. All the pipes before being laid should be carefully covered with two good coats of tar; and when placed in the trench, any parts of the metal that have been laid bare in the screwing of them up should be painted with tar afresh.

4. There is a considerable waste going on in the consumption by the public lamps. Apply governors to these, as I have already explained.

5. I understand that the gas which is consumed in the town-hall is not registered by meter, but passes direct from the service-pipes to the burners, although upwards of 50 lights are occasionally in use here. This is a mistake, all gas consumed (except such as is supplied to the public lamps), even that which is burned in the gas-works, should be registered through a meter and brought into the quarterly account. It is only by so doing that you can properly assess your leakage. It is not satisfactory simply to make an estimate of the consumption.

Your sale of gas per ton of coal carbonized amounts to only about 6500 cubic feet. This is the result of your defective carbonizing on the one hand, and the excessive leakage on the other. There is no reason why, with improved working, you should not sell 8000 cubic feet per ton, which is a very moderate computation.

In conclusion, I would suggest the early carrying out of the alterations and improvements I have named. Perhaps you will not have a more favourable opportunity than the present. Ironwork of every description is probably at its lowest point as regards price. It would also, in my opinion, be exercising a wise foresight if you could enter into a contract for a two or three years supply of coal at present prices, only, however, to be delivered as required. It is to be anticipated and hoped that coal and iron will soon increase in value.

(Signed) Thos. Newbigging.

Wisbech Water Company.—The annual meeting was held on the 26th ult., when a dividend of 5 per cent. was declared.

Colchester Gas Company.—The half-yearly meeting was held on the 27th ult. The accounts showed a balance of profit amounting to £2393, and dividends at the rate of 10 per cent. on the old, and 7 per cent. on the new shares were declared.

Barton District Local Board Gas Supply.—At the meeting of the Barton and Eccles Local Board, on the 5th inst., the clerk reported that a deputation from a sub-committee appointed by the board to deal with the question of the gas supply had waited upon the Gas Committee of the Salford Corporation with respect to the gas supply of the district. The matter was put before the committee by the several gentlemen forming the deputation, and eventually the deputation received from the committee an intimation that, so far as in their opinion was right, they would concede to the board what was asked, but that they could not enter into any further discussion on the subject until the propositions or representations of the board had been reduced to writing. The deputation accordingly withdrew and deliberated upon the matter, and passed certain resolutions, which were embodied in the following extract from the minutes of the sub-committee:—"Whereas complaints have been made to the local board of the impurity of gas supplied, of defective light, and of the excessive rate of charge for such gas (and the board believe such complaints to be well founded); and whereas the said local board have appointed a sub-committee with instructions to represent these complaints to the Gas Committee of the borough, and have empowered them to take the steps necessary to obtain a proper supply of gas, of proper illuminating power and purity as required by their Act, and an even pressure; and the said sub-committee have this day had an interview with the Salford Gas Committee, and have stated verbally the grounds of complaint, and asked for a remedy, and have pointed out the extreme difficulty which the Salford Gas Committee would have to supply the Barton district satisfactorily, considering the physical conditions of the district, and the fact that the gas-works are 60 feet higher than the average level of this district, and that the district beyond Barton (some parts of which are upwards of 200 feet higher than the level of Barton) are supplied by three outlets through their district; and the committee have on the invitation of the Gas Committee made suggestions for the consideration of the Gas Committee; and whereas the Salford Gas Committee have requested the sub-committee to reduce their suggestions to writing; it is ordered that the clerk do inform the Salford Gas Committee as follows:—That it is the opinion of this committee that before the Salford Gas Committee expend any portion of the £160,000 which they have resolved to expend on their gas-works, and works to supply this district (and especially so after the admissions made in their engineer's report, which was adopted by the council), it is desirable and necessary that they should satisfy themselves that it is practicable to satisfactorily supply the district with gas, the opinion of this committee being that it is not practicable. Ordered, that on the assumption that it is practicable, the clerk suggest—1, the provision of a gasholder in the district, the disconnexion of the supply-mains with the high-lying districts beyond, a reduction in the price, and a reduction in the differential rate between the consumers in the borough and in the local board district; 2, the provision of a holder in the district, and the supply of gas in bulk by the Salford Gas Committee, on terms to be arranged; 3, as is most desirable, the Salford Corporation be asked for their consent to the introduction of a Bill to enable the board to supply its own district with gas, and recompensing Salford for its outlay in respect of the district."

PROPOSED PURCHASE OF THE BRISTOL WATER-WORKS COMPANY.

A Special Meeting of the Bristol Town Council was held on Wednesday, the 7th inst.—the MAYOR (Alderman Edwards) presiding—to receive the report of the committee appointed by the corporation on the 1st of January, when it was resolved—"That the council is of opinion that it will be for the interest of the city to acquire the undertaking of the Bristol Water-Works Company, providing the purchase can be effected upon equitable terms," and it was referred to a committee of nine members to negotiate with the directors with that object in view.

The following report was now presented, and having been previously printed and circulated, it was taken as read:—

To the Council of the City of Bristol.

Your committee, before they deal with the important subject referred to them, think it advisable, so far as they understand the facts, to preface this report with a brief statement of the circumstances under which the company had its origin, and its progress to the present time.

It will be remembered that, prior to the year 1846, Clifton and the higher parts of the city were chiefly supplied with water from the Richmond Hill and Sion Springs, and the lower districts from a few public springs and fountains, aided in both cases by private wells.

Efforts were from time to time made to improve the means of supply, and in 1846, after a long parliamentary contest with the Society of Merchant Venturers, the present company was incorporated, with powers, since extended by subsequent Acts, to supply with water the city and county of Bristol, the parishes of Bedminster, Brislington, Long Ashton, and Abbots Leigh, in the county of Somerset, and St. George, Westbury-upon-Trym, Stapleton, Horfield, and Henbury, in the county of Gloucester.

The company are required to supply water constantly from five in the morning until nine in the afternoon of every day in the months of April, May, June, July, August, and September, and from six in the morning until nine in the afternoon of every other day in the year, subject to a further limitation, in case of unavoidable accident, or drought, frost, or repairs.

Provisions are also made to supply water for trade and other purposes, and to maintain reservoirs to compensate the districts from which part of the water is derived.

The works of the company, besides compensation and other reservoirs, comprise two large store and one compensation reservoirs at Barrow, with reservoirs at Bedminster and Clifton, supplied from the river Chew and other springs, and from the Midgal and Chelvey springs at Chelvey, in the county of Somerset. The store reservoirs at Barrow extend over 66 acres of land, and contain 350 million gallons of water, being a quantity sufficient for 70 days use, assuming the maximum consumption to be at the rate of 5 million gallons per day. From these sources a daily supply of between 4 million and 5 million gallons is now furnished to the district, and important works are in progress to increase the supply from the Chelvey and other springs, and to duplicate the mains from thence to the city. These works will add very largely to the resources of the company.

The rates to be taken by the company were fixed by the Act of 1846 at a pound rate on the annual value of the premises assessed, and varied from 5 per cent. on houses valued at £5 a year to £2 10s. per cent. on properties exceeding £200 a year, with an extra charge not exceeding 10s. per annum for water-closets and baths, but including, by the Act of 1862, horses and carriages, if kept for private use. In consideration of the new works undertaken in 1862, the rates were then increased by an addition of 1½ per cent. per annum upon the annual rack-rent or value of dwelling-houses in the parishes of Brislington, Ashton, Abbot's Leigh, Stapleton, and Horfield, and of 1 per cent. per annum on houses in any part of Bristol or of the parish of Westbury-upon-Trym, and afterwards of Henbury, which are supplied with water from any reservoir which is itself supplied by pumping.

In 1865 the company, being in embarrassed circumstances, arising from the extraordinary drought of the preceding summer, obtained powers to construct the additional works described in section 14 of the Act of that year, to raise further capital for their undertaking, and to impose a still increased rate, amounting to 1 per cent. per annum on the rack-rent or value of every house supplied by them with water within the limits of their Act of 1862.

The following is a statement, which your committee believe is correct, of the capital of the company granted by their several Acts, distinguishing the description of stocks, the amounts thereof created and raised, and the balance still unissued:—

Description of Stocks.	Amount Authorized.	Amount Raised.	Balance to Issue.
Debenture stocks under Acts of 1846, 1853, and 1872 / Mortgages under Acts of 1846, 1853, 1862, and 1865	£140,000	£134,000	£5,680
4000 £20 4½ per cent. preference shares, Act 1862, fully paid up	80,000	80,000	Nil.
4000 £20 4½ per cent. preference shares, Act 1865, fully paid up	80,000	80,000	Nil.
5 per cent. preference stock, Act of 1850	100,000	100,000	Nil.
8000 ordinary shares of £25 each, Act 1846, fully paid up	200,000	200,000	Nil.
8000 ordinary shares of £20 each, Act 1872, £8 paid (on the above, a call of £2, £16,000, making £10 paid, is due on the 31st of March)	160,000	64,000	96,000
Under the Act of 1872 there is power to issue mortgages or debenture stock to the extent of £40,000, but this power can be only partly exercised until the ordinary 1872 shares are fully paid up	40,000	Nil.	40,000
	£800,000	£658,320	£141,000

Subjoined also is another statement compiled from the annual reports of the company, showing the total amount of water-rates received by them from 1846 to 1876 inclusive, and of the dividends paid from 1846 to 1875. The dividend for the present year is not yet declared, but your committee are informed that, after meeting all engagements, it will be at the former rate of 10 per cent. on the paid-up share capital, leaving an unappropriated balance of not less than £6000.

Year.	Total Water-Rates.	Dividend.
1846	—	—
1847	£1,399	The £200,000 original
1848	2,420	shares were fully
1849	4,100	called in 1849.
1850	5,646	No Dividend.
1851	7,727	Ditto
1852	10,622	Ditto
1853	11,705	Ditto
1854	12,161	Ditto
1855	13,796	£0 14 0 per cent.
1856	14,925	0 16 0 "
1857	15,596	1 2 0 "
1858	16,122	1 8 0 "
1859	16,932	1 18 0 "
1860	17,910	2 6 0 "
1861	18,686	2 12 0 "
1862	20,533	3 2 0 "
1863	22,213	3 12 0 "
1864	22,320	2 18 0 "
1865	23,514	3 0 0 "
1866	25,945	4 0 0 "
1867	30,544	4 12 0 "
1868	35,870	5 16 0 "
1869	37,093	6 12 0 "
1870	40,761	7 14 0 "
1871	43,728	9 0 0 "
1872	45,121	10 0 0 "
1873	46,941	10 0 0 "
1874	51,329	10 0 0 "
1875	54,098	10 0 0 "
1876	56,772	Not declared.

The council will not fail to observe the steady and progressive increase in the water-rates, which have gradually advanced from £1309 in 1847 to the large sum of £56,772 in 1876. Your committee, having regard to the rapidly increasing population, not only in Bristol, but of the important suburbs which are within the limits of the company, see no reason why such increase should not be maintained.

The application of revenue is defined by the Act of 1865, section 12, as follows:—

1. In payment of the repairs, &c., and working expenses.
2. In payment of the interest upon the money borrowed under the Acts of 1846 and 1853.
3. In payment of a preferential dividend of 5 per cent. per annum on £100,000 5 per cent. preference stock created under the Act of 1850.
4. In payment of the interest on £34,000 borrowed under the Acts of 1853 and 1862.
5. In payment of interest on moneys borrowed under the Act of 1865.
6. In payment of any preferential dividend created or to be created under the Act of 1862.
7. In payment of any preferential dividend on any new shares or stock created under the Act of 1865.
8. In payment of a dividend not exceeding 10 per cent. per annum on the ordinary shares or stock of the company.
9. In payment of such a further dividend on the ordinary shares or stock of the company as may at any time be necessary to make up the deficiency of any previous dividend or dividends, when such previous dividend or dividends shall have fallen short of 10 per cent. per annum.
10. In the payment of a dividend on the £100,000 5 per cent. preference stock under the Act of 1850, in addition to the preferential dividend of 5 per cent. per annum, provided that such dividends shall not together exceed the rate of 10 per cent. per annum.
11. Any surplus, after the satisfaction of the purposes aforesaid, shall be invested and form a reserve in the manner and for the purposes in that behalf provided by "The Water-Works Clauses Act, 1847."

Such purposes (sections 76 to 79) are the formation of a reserve-fund to meet contingencies, with a provision (section 80), if the profits are more than the amount prescribed, for making a rateable reduction in the price of water.

The latter is a contingency upon which your committee, with reference to the appropriation of revenue before set out, do not congratulate the council.

Under these circumstances, it appeared clear to your committee that the chief question between them and the directors would arise under section 12, sub-section 9, of the Act of 1865. The tables already cited show that the company for several years after its formation paid no dividend to the proprietors, and that it is only since 1872 that the dividend has amounted to 10 per cent. Hence there is a very large sum to be made up to the proprietors of the ordinary share capital of £200,000 created by the Act of 1846, amounting, as your committee have been informed, to about £317,000, which those proprietors will be entitled to receive, if the resources of the company are adequate to the payment, before any claims can be made by the holders of the sum of £100,000 preference stock referred to under sub-section 10, and before the public can receive any relief in the water-rates, under the contingencies provided for by sub-section 11.

It is clear also that any claims under sub-section 10 are to be postponed until the unissued stock of the company, as well as their unexercised borrowing powers so far as the company find it necessary to issue and exercise them, are provided for and the dividends thereon paid.

The committee, for these reasons, consider that any claims under sub-section 10 have no appreciable value, and they refer now to the fact, because it will explain more fully that part of the negotiations which your committee have had with the directors.

It is unnecessary for your committee to assure the council that they fully appreciate the responsible duty entrusted to them, and that they have undertaken it with a deep sense of its importance, not only to the pecuniary, but to the personal, sanitary, and commercial interests of the citizens.

For some years past Parliament has favoured the transfer of the undertakings of water companies to municipal and sanitary authorities, and further facilities for the purpose are contained in the Public Health Act, 1875.

This principle appears now to be so well settled, that Parliament, in the last session, granted compulsory powers to a municipal body for the purchase of the works of a private company. It should also be added that most of the large towns in the kingdom possess their own means of water service; and that, even when large prices have been paid for the undertakings, the purchases have generally proved remunerative.

Upon a full and careful view of these facts, your committee, on the 31st of January last, informed the directors that the committee, acting for the council, were willing to negotiate with the company for the purchase of their undertaking, and would be glad to know if the company would sell, and if so, on what terms.

In reply to this communication, an answer was received from the secretary of the company referring to a previous letter from him on the 20th of January, in which he stated that it having been decided by a large majority of the council that it would be for the interests of the city to acquire the undertaking of the company on equitable terms, the board considered that it rested with the committee to name the bases upon which they proposed to treat for the transfer of the works to the corporation.

This resolution was considered by your committee on the 7th of February inst., when they determined to request an interview with the directors, and to propose to them at such interview as the bases of terms for the purchase by the corporation of the undertaking of the company:—

1. To assume the responsibility of the preference and debenture stocks of the company on the terms on which these stocks are now held by the proprietors, and to guarantee to them the respective interest and dividends thereon on the security of the city.
2. To guarantee a like dividend of 10 per cent. per annum to the holders of £200,000 ordinary share capital.
3. To guarantee a like dividend of 10 per cent. per annum to the holders of the additional share capital of £160,000 authorized by the Act of 1872, or on so much thereof as from time to time shall be paid up, with provisions for calling up the balance of such capital at times to be agreed on between the parties.
4. These proposals to be subject to the approval of the council, and also to an investigation to be made by the committee as regards the works of the company, and their sufficiency for the present and future supply of the city, and also as regards their financial position.

These resolutions were communicated to the directors and elicited the following reply, dated the 21st of February:—

Resolved—That the board having considered the resolution of the committee appointed to negotiate for the purchase of the undertaking of the Bristol Water-Works Company, dated Feb. 7, 1877, express their willingness to submit the same to the shareholders of the company, provided there be added thereto the following terms:—

1. The payment to the proprietors of the £200,000 ordinary stock of the company of an annual sum of £4000, in consideration of their statutory right to arrears of dividend as given by the Bristol Water-Works Act, 1862, confirmed by the 12th section (sub-section 9) of the Bristol Water-Works Amendment Act, 1865.
2. That proper provisions be made for the protection or compensation, as the case may be, of all the officers of the company.
3. That a joint committee of both sides be appointed to go into the various points of detail not covered by the various resolutions.

Your committee on the 22nd of February considered the additional terms proposed by the directors, and resolved—

That they will submit to the council, and recommend them to approve, the terms proposed by the committee in their resolution of the 7th of February, for the purchase by the corporation of the undertaking of the Bristol Water-Works Company, with the additions made to such terms by the directors of the company, as stated in their resolution of the 23rd of February inst., it being understood that the committee do not propose, under circumstances that may hereafter arise, that a further dividend should be paid over and above the preferential dividend of 5 per cent. per annum to the holders of £100,000 preference stock created by the company's Act of 1850, and referred to in the Act of 1862, section 31, sub-section 8.

It should be observed that this reference is not correctly quoted, as the 31st section of the Act of 1862 was repealed, and replaced by section 12 of the Act of 1865, to the same effect, as already cited.

On the 26th of February a further resolution of the directors was received by your committee, stating—

That the board having been informed that the committee appointed to negotiate for the purchase of the water-works had resolved to recommend the council to accept the terms referred to and named in the board's resolution of the 21st of February, but that the committee did not propose that a further dividend over and above 5 per cent. per annum should at any time be paid to the proprietors of the £100,000 5 per cent. preference stock, suggested that the claims (if any) arising in respect of such preference stock, should they not be previously settled, be satisfied by the corporation, in the event of their recognition being thought proper by Parliament.

It now only remains for your committee to commend this important subject, the most weighty and important that has engaged public attention since the acquirement by the corporation of the Dock Estate in 1848 to the impartial and attentive consideration of the council. Better terms for the city than those now proposed cannot be made with the company; but although the conditions are onerous, your committee believe them to be fair as between the parties, for, notwithstanding all that has been said, and may be said, as to the great concessions made to the company, whereby their present independent station has been attained, still it must be remembered that if they have now a season of prosperity, they have also had seasons of adversity, and that they hold their undertaking by a parliamentary title which the Legislature is not likely to interfere with by compulsion

(while the company observe the conditions they have undertaken), except at the full value of the property.

Your committee suggest that the best plan for the council to adopt will be, to decide generally whether it is expedient or not that the negotiation should be proceeded with, on the principles stated, without at present entering into matters of detail. If the council decide in the affirmative, your committee think that the same question should be submitted at as early a date as possible to the shareholders of the company. If both parties agree to the proposals, your committee, on being instructed to that effect by the council, will negotiate details with the directors, reporting again, as soon as definite terms are settled, to the council for their approval.

Your committee in any case will be glad to receive instructions how to proceed with the competing Bill of the Bristol District Water Company, now before Parliament. A petition against the Bill, both on merits and clauses, has been settled and deposited by the Parliamentary Bills Committee, but except to provide for some questions that relate to the breaking up of the streets, the committee do not feel justified either in supporting or opposing the principle of the Bill until it has been further considered by the council.

Your committee have, however, no hesitation in saying that, if the council decide to proceed with the proposed purchase, it would be most embarrassing to them, as the municipal authority acting only in the public interest, if competing powers within the same district were granted to private parties, more especially as such parties appear to be for the most part unconnected with Bristol, and would doubtless deal with the undertaking, if they acquired it, in the interests only of their own shareholders, or perhaps as a speculation to be disposed of on terms of profit, either to the present company or the corporation.

Your committee regret the length of this report, but it is difficult to condense it, with due regard to the intricate points raised, and to the importance of the duty now devolving on the council.

Council House, Bristol, Feb. 28, 1877. GEO. WM. EDWARDS, Mayor.

Alderman BAKER moved—"That, subject to the postponement of the annual payment of £4000 for a period of five years, the report now read be approved, and that it be referred to a committee to make arrangements for the transfer of the undertaking of the Bristol Water-Works Company to the Corporation on their terms stated in the report, subject to the inquiries referred to in section 4 of the resolution of the committee of the 7th of February last, and also to a satisfactory settlement of the details not covered by the various resolutions; that the committee report their proceedings herein for future consideration and approval."

Mr. WHITWELL seconded the motion.

The TOWN-CLERK intimated that a deputation of ratepayers desired to be admitted, in order to present resolutions on the subject of the proposed purchase, drawn up at public meetings of the ratepayers, and that Mr. Brown, one of their body, should be heard in support of them.

After some conversation on the point,

The TOWN-CLERK advised the council that the parties had no legal right to be heard, and he suggested the adoption of the following motion—"That this council decline to receive the deputation, or to hear their advocate, Mr. Brown; but if the resolutions referred to be presented by a member of the council, they shall receive their careful and impartial consideration."

The motion was unanimously agreed to, and the discussion of the report was proceeded with.

Mr. MATTHEWS handed in memorials that had been adopted at public meetings held at Colston Hall and the Athenæum, protesting against the purchase of the water-works.

The TOWN-CLERK read the memorials, which were ordered to be entered on the minutes.

Mr. MILLS moved, and Mr. TOWNSEND seconded, an amendment to the motion for the adoption of the report, to the effect that the further consideration of the question be postponed until that day month.

After a long and ably-conducted debate, the amendment was lost by 22 votes to 12, and the motion was put and carried. It was also resolved to oppose the Bristol District Water Bill now before Parliament, on the grounds raised in the report.

ARREST OF THE DEFAULTING OFFICER OF THE COLNEY HATCH GAS COMPANY.—The *Otago Daily Times* of the 3rd of January states that, on the arrival of the *May Queen* at Port Chalmers, after a long and eventful voyage, the absconding assistant secretary of the Colney Hatch Gas Company, William Henry Wood, was arrested by London detectives who had been sent out for the purpose. It will be remembered that the culprit left England in September last in company with a young woman, not his wife, and that an investigation of his accounts showed that he had fraudulently appropriated to his own use £600 or £700 belonging to his employers. Information having been given at Scotland Yard, and it having been ascertained that he had taken passage in the *May Queen*, the telegraph was set to work, and early in December the police authorities of Dunedin received intimation of the absconder, with orders to arrest him on his arrival. In the meantime Dectective Dalton was despatched to Melbourne by the clipper ship *Kent*, and thence made his way to New Zealand in the steamer *Tararua*, expecting to find the capture had been effected. The *May Queen*, however, made a long passage, and hence the detective arrived before her, and, with Sergeant Hanlon, the officer in charge of the Port Chalmers Police, met the ship and arrested his man. Amongst the property found upon Woods was a draft upon the Bank of New Zealand for £450. On the same day he was taken before the magistrates, and Detective Dalton having given the necessary formal evidence, Woods was committed to the Dunedin Gaol to await the arrival of the Governor's warrant for his transmission to England.

SOCIETY OF ENGINEERS.—At the meeting on Monday evening, March 5, in the Society's Hall, Westminster Chambers—Mr. T. Cargill, C.E., president, in the chair—a paper was read by Mr. J. Walter Pearse on the Mechanical Firing of Steam-Boilers. The author first pointed out some of the disadvantages of hand stoking, and observed that so far back as 1813, mechanical firing was proposed. In 1822, Mr. J. Stanley invented a stoker with crushing rollers and a single horizontal fan, to which, in 1834, he added rocking fire-bars. In 1838, Mr. Juckes patented his first stoker, and in 1841 he invented the endless chain of fire-bars, modifying it again in 1842. In 1863, Messrs. Wilson and Smith brought out their furnace in which the fire-bars were made to travel backwards, carrying the fuel from a hopper to the back of the grate, an arrangement which was improved upon by Messrs. Vicars and Smith in 1867. In 1870, Mr. Dillwyn Smith patented his stoker, in which the fuel is fed on to distributing-fans revolving horizontally. This arrangement was improved upon, in 1870, by Mr. J. F. Deacon. Further additions were subsequently made by Mr. T. Henderson. The Henderson stoker was then described by the author. In it the supply of fuel is effected in the same way as in the Dillwyn Smith machine, but the fire-bars are made to move by simple gear connected with the stoker. Every other bar rises and falls, while the rest slide to and fro, the effect of this action being to clear off the clinker. The Frisbie feeder, improved by Mr. J. M. Holmes, is for slow combustion and intermittent feed. The coal is thrust up underneath, and in the middle of the fire, so that the gases evolved are consumed on passing through the incandescent mass. This stirs the fire and propels all clinker to the circumference of the circular revolving grate. Mr. Holroyd Smith's "Helix" fire-feeder gives a continuous feed from below, by means of a screw working in a casing connected at its upper side with a trough, which takes the place of one or two fire-bars. The saving effected by these stokers was stated to be twofold—first in the quality of the fuel used, and next in the quantity consumed, a reduced first cost being also incurred, owing to smaller boilers and fire-grates serving for a given power, with more perfect combustion.

GAS AFFAIRS IN AMERICA.

REPORT OF THE GAS COMMISSIONERS IN RELATION TO THE SUPPLY OF GAS TO THE CITY OF BOSTON.

(*Continued from p.* 316.)

Comparison of Companies.

In comparing the results obtained by those companies manufacturing coal gas, so as to arrive at intelligent conclusions in regard to the cost of the gas, we have especially taken into consideration the amount of gas made per ton of coal; the cost of the coal per ton; the labour employed in the manufacture of the gas; the amount of gas sold per mile of pipe main, which gives us in a measure the comparative cost of distribution; and the quality of the gas, since it is evident that gas of a poor quality can be made cheaper than that of a good quality.

It may be assumed that the investment is a proper one, or, if it is not, that fact ought to militate against the company; and that all valuable improvements in gas machinery have been adopted, since it is evident that improvements which increase the amount of gas made per ton of coal increase the profits of the company. And we may therefore assume that any deficiencies, which are found to exist, result from bad management of the funds, or at the works. Unfortunately we are not authorized to make public all of the items of information which we possess, since in most cases some of them have been given to us in strict confidence, but we have ourselves been enabled to make satisfactory comparisons, and arrive at satisfactory conclusions, which are given herewith.

We have also compared the cost of the manufacture of gas in many of the gas companies in the United States with that in the principal European companies, the published accounts of which we have. From these reports the cost of manufacture can be accurately determined, and the calculations in the following table have been made from them. These published accounts we consider of great importance, and shall refer to them again in the last section of this report. The table also contains those items concerning the manufacture of gas in some of the United States companies which have not been given to us confidentially. In the case of the Philadelphia Gas Company, however, all the items can be given, since the calculations have been made from the published account.* This account of the Philadelphia Gas Company is very interesting, since the works are managed under the direction of the city officials, and are, therefore, subject to political influence to a greater or less extent. On examining this account, we are struck at once by the fact that the price of the gas is much lower than that in any of the other cities, while the cost of the gas is much higher. This diminished price with increased cost can be partially explained by the fact that more than five-sixths of the cost of the works has been paid off by the establishment of sinking-funds and the accumulated profits. The account of these works will be spoken of later in reference to the management of gas undertakings by municipal authorities.

In the following table the cost of labour includes merely the wages and salaries at the works; working expenses include labour, purification, maintenance of works, and wear and tear of works; the cost of manufacturing includes the cost of coal and the working expenses; the total cost of the gas includes all charges except interest on the capital.

Now, in comparing the management of the Boston Gas Company with that of other coal gas companies, we find, in the first place, that their coal has cost more on the average, per 1000 cubic feet of gas, than that of any other company delivering more than 50 million cubic feet per year, except the Lowell, Mass., and Manchester, N. H., companies, whose freight is 1·00 dol. more per ton than that at Boston. The same is true of the Dorchester Gaslight Company, whose frieght and extra handling make the coal cost much more than in Boston. This is undoubtedly due to the use of the expensive Albertite as an enricher, the price of which in 1875 was more than 25·00 dols. per ton. The ordinary caking coal cost about 6·75 dols. per ton. We should expect with the use of 5 to 7 per cent. of Albertite, which yields about 15,000 cubic feet per ton of a very rich gas, a much larger average yield per ton of coal than we find for the year 1875. In fact, the yield per ton is less than that of any of the other companies of which we have record, except those of Philadelphia, Dorchester, Jamaica Plain, Manchester and Concord, N. H., Milwaukee, Wis., and Columbus, O. In the last two places very cheap coals are used, which yield only small amounts of gas, and in Philadelphia no enriching coal whatever is used. This small yield is probably due chiefly to the use of iron retorts with the Albertite, as has already been mentioned, and during three months of the present year, 1876, while only clay retorts were being used, the yield was about 10,500 cubic feet per ton of coal. The influence of the Albertite on the quality of the gas is seen by the high illuminating power, which is higher than that of any of the other companies using coal alone.

The leakage or unaccounted-for gas in Boston is very small in comparison with most other coal gas companies. This would naturally be expected, on account of the thickly settled district supplied by the Boston Gas Company, which distributes a larger amount of gas per mile of pipe main than any other company in the United States of which we have a record. Hamburg is the only European city with which Boston can be compared in reference to leakage, since that is the only one in whose accounts we find both the items of leakage and miles of pipe main; and by comparing the two it will be seen that the condition of the mains in Boston is superior to that of those in Hamburg. The smaller proportion of unaccounted-for gas in the New York Mutual works may partially be explained by the higher specific gravity of the gas, the amount distributed per mile of pipe being about the same as in Boston. The small per centage of leakage in Lowell and Roxburg, where only about 1,500,000 cubic feet are distributed annually per mile of pipe, can only be explained by the superior condition of the mains. We find also that the cost of labour is rated at a slightly higher figure in Boston than in most of the other large cities. In Philadelphia, however, labour costs about 10 cents more per 1000 cubic feet than in other companies. In Europe labour in general is much lower than in this country, so that we expect to find the labour account of the European gas companies smaller than our own.

In the Hamburg Gas Company the cost of labour is about 17 cents. per 1000 cubic feet of gas sold, which is accounted for by the higher price for labour in that city than in the other cities. Thus, the report of the Hamburg Company gives the rates of wages as 0·81½ dol. for an ordinary day labourer, 1·22 dol. for an inexperienced hand in the works, and 1·47 dol. per day for an experienced hand in the works. These rates are about double those in the other European cities, and they are not far from being one-half of those in this country. It may be said, however, in explanation of the slightly higher rate of labour in the Boston Gas-Works, that the company are very much embarrassed by a lack of room, so that a larger number of men is required than if the ground and buildings could be economically arranged. In one instance a piece of work requires six men, which could be easily performed by two with a different arrangement of the yards and buildings.

In regard to the distribution, about the same may be said as of the labour. The cost of distribution is rated higher than that of any of the

* Forty-first Annual Report of the Trustees of the Philadelphia Gas-Works, January, 1876.

TABLE.*

	Boston.	Roxburg.	Charlestown.	Dorchester.	South Boston.	Jamaica Plain.	Brookline.	Salem.	Lowell.	Fitchburg.	New Haven, Conn.	Hartford, Conn.	Manchester, N. H.	Milwaukee, Wis.	Columbus, O.
	1875.	1875.	1875.	1874.	1874.	1874.		1874.	July 1, 1874, to July 1, '75.	1873.					
1. Amount of gas made . . . Feet . .	688,000,000	90,498,590	62,994,000	30,641,292	53,204,120	15,000,000	24,000,000	33,000,000	78,348,000	8,659,000	112,000,000	100,000,000	54,000,000	70,000,000	60,000,000
2. Amount of gas sold . . . Feet . .	631,000,000	82,364,818	51,643,000	24,159,399	46,921,573	13,200,000	20,000,000	28,000,000	71,629,000	7,398,000	103,040,000	93,000,000	50,000,000	55,000,000	51,000,000
3. Amount of gas unaccounted-for. . . Per cent.	8·3	8·99	18	21 1-6	12	12	18	15	8½	14½	8	7	7	20	15
4. Amount of coal used . . . Tons . .	71,872	8,959	5,850	3,295	5,421	1,800	2,500	3,300	7,768½	900	10,500	10,000	6,000	12,000	10,000
5. Amount of gas made per ton of coal . . . Feet . .	9,572	10,101·4	10,768	9,299	9,814	8,333	9,600	10,000	10,085	9,621	10,666	10,000	9,000	5,833	6,000
6. Amount of gas sold per ton of coal. . . . Feet . .	8,780	9,193·5	8,828	7,332	8,655½	7,333	8,000	8,484	9,220	8,220	9,813	9,300	8,383	4,583	5,100
7. Annual cost of coal	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
8. Cost of coal per ton (average) . . . Dols. .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	2·40
9. Cost of coal per 1000 cubic feet of gas made	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
10. Cost of coal per 1000 cubic feet of gas sold	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
11. Annual cost of labour	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
12. Cost of labour per 1000 cubic feet of gas sold	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
13. Total working expenses per 1000 cubic feet of gas sold . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
14. Total cost of manufacturing	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
15. Cost of manufacturing per 1000 cubic feet of gas sold . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
16. Number of miles of pipe main	112	51½	32	34½	22½	20	38	24	41	9	60	66	26	50	32
17. Amount of gas sold per mile of pipe main . . . Feet . .	5,633,928	1,599,316·7	1,613,844	700,272	2,085,403	660,000	526,316	1,166,666	1,747,043	822,000	1,717,333	1,409,091	1,934,615	1,100,000	1,593,750
18. Cost of distribution per 1000 cubic feet of gas sold . . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
19. Cost of gas delivered per 1000 cubic feet of gas sold . . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
20. Received for residuals per 1000 cubic feet of gas sold . . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
21. Cost of gas (less residuals) per 1000 cubic feet of gas sold .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .
22. Prices charged for 1000 cubic feet . . . . . Dols. .	2·50	2·70	3·00	4·00	3·00	4·00	3·60	3·50	2·50	3·50 to 4·00	3·00	3·00	Aver., 2·50	3·00	Aver., 2·58½
23. Illuminating power . . . . . Candles.	18 to 19	17½	17	16½	17½	17	17½	15	16	15	16	16	17	15	16–17
24. Specific gravity	0·475	0·422	0·385	0·411	0·410	. . .	0·439	. . .	. . .	0·440	. . .	. . .	. . .	. . .	. . .
25. Capital paid in . . . . . Dols. .	2,500,000	600,000	500,000	400,000	440,000	Not given.	350,000	300,000	500,000	60,000	1,000,000	750,000	100,000	650,000	400,000
26. Bonds issued	500,000	. . .	. . .	77,272·18	40,000	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	7 p. ct., 20,000	8 p.ct. 100,000
27. Capital per ton of coal carbonized . . . . . Dols. .	34·80	66·97	85·47	121·39	81·16	. . .	140·00	90·91	64·36	66·66	95·23	75·00	16·66	54·16	40·00
28. Capital per 1000 cubic feet of gas sold . . . . Dols. .	3·96	7·28	9·68	16·55	9·37	. . .	17·50	10·71	6·98	8·11	9·70	8·06	2·00	11·82	7·84

	Albany, N. Y.	Washington, D. C.	N. Y. Mutual.	Philadelphia.	London (Chartered).	S. Metropolitan, London.	London.	Commercial (London).	Manchester. Municip. Cor.	Halifax (City Corporation).	Rochdale (City Cor.).	Hereford (City Cor.).	Berlin.	Hamburg.	Paris.
		1874.	1875.	1875.	1874.	Last Six Months, 1874.	Last Six Months, 1874.	Last Six Months, 1874.	1874.				July 1, 1873, to July, 1874.	1874.	1874.
1. Amount of gas made . . . Feet . .	88,000,000	251,688,000	547,800,000	1,873,192,000	4,669,725,000	418,963,000	567,707,000	476,086,000	. . .	246,912,000	231,496,000	48,187,334	1,827,508,676	721,751,228	. . .
2. Amount of gas sold . . . Feet . .	82,000,000	238,882,500	509,463,700	1,575,939,618	4,167,008,000	380,574,000	521,486,000	422,763,000	1,778,457,000	218,942,900	204,000,000	41,871,192	1,641,328,461	721,943,874†	5,673,689,557
3. Amount of gas unaccounted-for. . . Per cent.	6·8	5	7	15·8	9·66	8·2	7·2	10·4	. . .	11·32	11·8	13·1	10	14·4	. . .
4. Amount of coal used . . . . Tons . .	8,800	22,930	38,000	267,596	471,416	43,878	54,110	48,386·19	. . .	25,591	22,596	4,646	185,285½	72,506	. . .
5. Amount of gas made per ton of coal . . . . Feet . .	10,000	10,976	10,395	8,559·6	9,906	9,616	10,492	9,839	. . .	9,648	10,084	10,371	9,856	9,954	. . .
6. Amount of gas sold per ton of coal. . . . . Feet . .	9,318	10,418	9,684	7,201	8,839	8,673	9,637	8,738	. . .	8,555	8,886	9,012	8,858	8,521	. . .
7. Annual cost of coal . . . . . Dols. .	. . .	. . .	. . .	1,465,264·49	3,294,059·20	221,536·32	333,478·94	273,454·83	907,670·53	96,980·17	141,630·09	37,995·03	1,323,747·81	508,754·85	3,374,059·00
8. Cost of coal per ton . . . . . Dols. .	. . .	. . .	. . .	6·714	6·99	5·05	6·16	5·65	. . .	3·77	6·17	8·18	7·14	7·01	. . .
9. Cost of coal per 1000 cubic feet of gas made . . Dols. .	. . .	. . .	. . .	0·78	0·70	0·53	0·59	0·57	. . .	0·39	0·61	0·79	0·72½	0·70	. . .
10. Cost of coal per 1000 cubic feet of gas sold . . . Dols. .	. . .	. . .	. . .	0·93	0·79	0·58	0·64	0·65	0·51	0·44	0·69	0·91	0·80½	0·82	0·59
11. Annual cost of labour . . . . . Dols. .	. . .	. . .	. . .	582,332·24	412,705·90	51,228·28	59,417·11	45,625·56	144,048·31	29,127·08	16,194·87	5,180·25	146,116·84	103,818·00	354,947·00
12. Cost of labour per 1000 cubic feet of gas sold . . Dols. .	. . .	. . .	. . .	0·369	0·11	0·13	0·11	0·18	0·08	0·13	0·08	0·12	0·09	0·17	0·06
13. Total working expenses per 1000 c. ft. of gas sold. Dols. .	. . .	. . .	. . .	0·58	0·24	0·18	0·23	0·25	0·29	0·18	0·15	0·28	0·217	0·36	0·25
14. Total cost of manufacturing . . . . . Dols. .	. . .	. . .	. . .	2,384,559·26	4,292,018·24	292,294·13	453,087·93	379,124·94	. . .	136,598·50	172,429·37	49,826·50	1,680,624·00	731,169·00	4,789,588·00
15. Cost of manufacturing per 1000 c. ft. of gas sold . Dols. .	. . .	. . .	. . .	1·51	1·03	0·76	0·87	0·90	. . .	0·62	0·84	1·19	1·02	1·18	0·84
16. Number of miles of pipe main	36	116	110	653	. . .	. . .	. . .	. . .	505	. . .	. . .	. . .	. . .	163	1,011½
17. Amount of gas sold per mile of pipe main . . . Feet . .	2,270,000	2,059,332	4,631,485	2,413,383·7	. . .	. . .	. . .	. . .	3,521,697	. . .	. . .	. . .	. . .	4,434,489	5,608,629
18. Cost of distribution per 1000 cub. ft. of gas sold . Dols. .	. . .	. . .	. . .	0·22	0·05	0·07½	0·06	0·07	0·06½	0·11	0·07	0·04	0·04	0·12	0·05
19. Cost of gas delivered per 1000 cub. ft. of gas sold. Dols. .	. . .	. . .	. . .	2·15	1·18	0·94	1·11	1·04	1·02½	0·92	1·12	1·33	1·17	1·80	1·30
20. Received for residuals per 1000 c. ft. of gas sold . Dols. .	. . .	. . .	. . .	0·16	0·30½	0·35	0·33	0·29	0·18	0·25	0·16	0·30	0·40½	0·59	0·58
21. Cost of gas (less residuals) per 1000 c. ft. of gas sold Dols. .	. . .	. . .	. . .	1·99	0·88	0·59	0·78	0·75	0·84½	0·67	0·96	1·03	0·76½	1·21	0·72
22. Prices charged for 1000 cubic feet . . . . . Dols. .	3·25	2·50	2·75	2·30	1·367	Aver., 0·827	Aver., 1·23	Aver., 1·09	0·95	Aver., 1·09	1·34	. . .	Aver., 1·19	1·54 Av. 1·36	Aver., 1·51
23. Illuminating power . . . . . Candles.	17	16½	19	16·61	16	. . .	. . .	. . .	18½	. . .	18–19	. . .	16–17	14	. . .
24. Specific gravity	. . .	. . .	0·729	0·413	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	. . .	0·398	. . .
25. Capital paid in . . . . . Dols. .	250,000	350,000	2,500,000	. . .	17,073,000·00	2,085,350·00	3,970,383·00	2,439,000·00	. . .	. . .	. . .	. . .	. . .	. . .	18,060,000·00
26. Bonds issued	. . .	. . .	6 p.ct. 500,000	2,929,806·07	4,409,170·00	. . .	715,938·64	. . .	. . .	. . .	. . .	. . .	. . .	. . .	12,882,727·00
27. Capital per ton of coal carbonized . . . . Dols. .	28·41	15·26	65·79	10·95	36·21	47·52	73·37	50·40	. . .	. . .	29·61	. . .	. . .	. . .	. . .
28. Capital per 1000 cubic feet of gas sold . . . . Dols. .	3·05	1·46	4·90	1·86	4·09	5·47	7·61	5·77	. . .	. . .	. . .	. . .	. . .	. . .	. . .

* With regard to most of the companies, we have the replies to questions 7 to 15 inclusive, and 18 to 21 inclusive, but are unable to make them public on account of the confidential manner in which they have been given. † On hand June 1, 1874, 104,150,977 cubic feet.

other companies whose figures in this respect we have, when it ought to be smaller, on account of the large amount of gas sold per mile of pipe. As a partial explanation of this, it may be said that the Boston Gas Company keeps men constantly employed at its own expense to answer calls made by the consumers in reference to leaky fixtures, tight stopcocks, &c.; which is not done by any other gas company, so far as we are aware. In the European cities the cost of distribution is very small, much smaller than in this country, on account of cheaper labour and cheaper material. This fact may be seen by comparing the cost of distribution in those cities with that in Philadelphia, where it is almost as small as in any of the United States Companies from which we have accurate reports.

These items, the cost of coal and labour, and of distribution, are the principal ones which go to make up the cost of the gas, being nearly three-fourths of the total cost at the burner, not including interest on the capital. From the total cost of manufacture must be deducted the receipts from the sale of residuals—that is, the coke, tar and ammonia,—the sale of which brings a greater or less revenue, according to the location of the company. In Europe the manufacture of the residuals forms a very important branch of the gas industry; in many places the receipts from the sale of these being equal to much more than one-half of the cost of the coal. In most works in this country the ammoniacal liquor cannot be utilized, and the coke and tar sell for a much less price than in Europe. The receipts for residuals in the Philadelphia works amounted to 16 cents per 1000 cubic feet sold, which is not far from the average in this country, so far as we have been able to learn.

In regard to the price charged to consumers, it will be seen by reference not only to the above table, but also to the list of the prices charged by nearly all of the gas companies in the United States, that the citizens of Boston are served better than those of any city, with the exception of Allegheny City, Penn.; Ashtabula, O.; the People's Company, Cleveland, O.; Cincinnati, O.; Lowell, Mass.; Morris, Ill.; Philadelphia and Pittsburgh, Penn.; Providence, R. I.; Shelbyville, Ind.; Tidioute, Penn.; Washington D. C.; Wheeling, W. Va.; and Washington, C. H., O. Detroit, Mich., is omitted from the list. In Detroit portions of the city supplied by both companies enjoy a low price, 1·00 dol. being charged by the new company, and 50 cents by the old; but in those portions supplied only by the old company the price is 3·00 dols. Of the above cities all but Lowell, Detroit, Providence, and Philadelphia are either supplied with pure petroleum gas, or are situated in close proximity to the coal regions, where coal is very cheap. Of these four, Detroit has, as mentioned, cheap gas in one portion of the city only, on account of competition; and in Philadelphia the manufacture of gas costs more than it does in Boston, the low price being due to the fact that but small profits are necessary for the payment of interest on the capital. In Lowell and Providence the prices are the same as in Boston. It is worthy of note that in all of the large cities, New York, Brooklyn, Chicago, &c., which are supplied by more than one company, the price of gas is higher than in Boston. The reasons for this will be discussed in speaking of the results of competition in the supply of gas to large cities.

It will be noticed that there is a very great difference in the different companies in regard to the proportion of capital to the business done—the amount of capital per ton of coal varying in the United States companies from 10·95 dols. (Philadelphia), or omitting that company, since it is a municipal one, from 15·26 dols. (Washington, D. C.) to 140·00 dols. (Brooklyn, Mass.); and per 1000 cubic feet of gas sold from 1·46 dol. (Washington) to 17·50 dols. (Brooklyn). This must be due to a great extent to improper investments or expenditures, and is the great argument against any monopoly being in the hands of a private corporation, and in favour of its management by municipal authorities; since a corporation having a monopoly has the power to charge such a price as may be necessary to pay its dividends, and has therefore no inducement to diminish its capital, but, on the contrary, to increase it. The average capital and borrowed money in the London companies in 1873 was 34·24 dols. per ton of coal carbonized, and in 1874 it was 39·79 dols. per ton of coal, and 4·54 dols. per 1000 cubic feet of gas sold.

After the lengthy hearing before the Board of Aldermen, previous to our appointment, our inquiries were naturally directed towards the manufacture of gas from petroleum and naphtha, especially the Gale and Rand process. After a visit to the New York Mutual Works, we proceeded to Saratoga, where this process was first put into operation for the purpose of lighting a city. The Saratoga Company tried it for two years, but, as we were informed by the treasurer, without success, since it was found impossible to make gas under the Gale and Rand patents from petroleum alone (mixed with air) which would not be variable. On some nights it was of good quality, while on others great complaint was made on account of its inferior illuminating power. Petroleum was, therefore, finally abandoned, and coal gas again used.

At the New York Mutual works we found everything appertaining to the manufacture of gas to be of superior order and under the best of management, and through the courtesy of the superintendent we received all attention and information. These works were established in 1873. The stock of the company is owned by large capitalists of New York, and it is no doubt owing to their influence that the company was so successful in gaining a favourable position in the city in competition with the other long established companies. The capital stock was nominally 5 million dols. but only 2,500,000 dols. were paid in, and 500,000 dols. in bonds issued. During the first year many obstacles were encountered in making the petroleum gas, both in the distillation and the carbonizing. At first a large amount of air was added, so as to dilute it until the proper candle-power was obtained; but experience soon taught them that the less air added the better, and also that naphtha was better for gas purposes than petroleum.

At the time of our first visit to these works, July 14, 1875, the naphtha was placed in a boiler, under which was an open fire, and boiled. The vapour was then conducted through a 2-inch iron pipe nearly to the further end of the retort, which being kept at a nearly white heat, quickly decomposed the vapour to a fixed gas. This gas was mixed with 14 to 15 per cent. of air, the mixture passed through the station-meter, and then mixed with the coal gas, which had been purified in the usual manner, and measured by a separate meter. The mercantile gas thus obtained consisted of about 70 per cent. of coal gas, and 30 per cent. of mixed naphtha gas and air; or 70 per cent. of coal gas, 25½ per cent. of pure naphtha gas, and 4½ per cent. of air. Since then the amount of air has been still further diminished. This small proportion of air is added merely to keep the mixed gas of a uniform strength, the quality being tested every half hour with a jet photometer, so that any sudden variation is detected at once, and a little more or less air added to correct it.

In this way a gas was furnished to the consumers very pure and of a high illuminating quality. It contained, at the time of our examination, only traces of ammonia (about one-quarter grain in 100 cubic feet), and less than 9 grains of sulphur in 100 cubic feet. Its specific gravity averaged 0·729, and its illuminating power between 20 and 21 candles. The superintendent informed us that he intended to keep the illuminating power about 20 candles, but that it varied between 19 and 21 candles.

On account of its high specific gravity, it is subject to a lower per centage of leakage (the unaccounted-for gas being only about 7 per cent.) and the consumer finds such a saving at the burner as to materially reduce the amount of the gas bills. This fact was ascertained by inquiring of several large consumers of the New York Mutual Company's gas. At the Fifth Avenue Hotel, the Everett House, and the St. Nicholas Hotel the proprietors expressed themselves as perfectly satisfied with the quality of the gas, as well as the reduced amount of their consumption.

Since much had been said at the hearings before the Boards of Aldermen of Boston and Lowell about the smoky qualities of the New York Mutual gas, we obtained from the treasurer of the Manhattan Gaslight Company a list of the names of those parties who were said to have returned to them after having given the New York Mutual gas a fair trial, and we interviewed them personally.

We found that the statements concerning the smoky qualities of the Mutual gas, as given in evidence at the hearings before mentioned, were hardly just, inasmuch as in most cases where such complaints were made it was found that the parties had taken no precautions against burning too large a volume of gas, and the rooms were in most cases low and poorly ventilated. The smoking was due entirely to the fact that the Mutual gas was a rich gas, 19 or 20 candle power, and not at all to the fact that naphtha gas was one of its constituents. The same effect would have been produced by a pure coal gas of the same illuminating power.

Not satisfied with the inspection of stores and hotels, we desired to see a dwelling-house where the Mutual gas was burned, and accepted the invitation to visit one, which perhaps contains as fine frescoes and as delicately tinted walls as any dwelling-house in New York City. Here, although we found large chandeliers (one containing 50 burners) and bracket-lights in such positions that the slightest smoke would have discoloured the frescoes and walls, we did not, in any instance, after carefully inspecting the house from basement to attic, find the slightest discoloration from smoke. After so severe a test as this, we were forced to conclude that the Mutual gas, with proper burners, is fully equal in point of cleanliness to that of any other manufacture; and, indeed, we were surprised to find that any gas could have been burned in such exposed positions for more than two years without some deposit. It is not, of course, necessary, in enriching with naphtha, to add so much as to bring the illuminating power to 20 candles. A gas of 18 candles would be as acceptable to the consumer as one of 20 or 21 candle power, and would be less liable to smoke than a coal gas of equal illuminating power, burned through the same burner and under the same pressure.

The New York Mutual Company distribute, through about 110 miles of pipe main, about 509 million cubic feet of gas per year, at a cost to the consumer of 2·75 dols. (reduced in 1876 to 2·50 dols.) per 1000 cubic feet. The Boston Gas Company have about 112 miles of main, and deliver 631 million cubic feet, at a price of 2·50 dols. (reduced April 1, 1876, to 2·25 dols.) per 1000 cubic feet. The gas unaccounted-for in the case of the Mutual Company is about 7 per cent., and in that of the Boston Company about 8½ per cent., so that with the actual capital paid in by the Mutual Company, 2,500,000 dols. with 500,000 dols. bonds, and the Boston Company's capital and bonds being of the same amount, we have two gas companies so nearly equal in respect to capital, capacity of works, and compactness of their districts, that we may safely compare one with the other, without any other prejudice than may arise from superiority of the process of the manufacture, or from the economy thereof.

Since it is a very difficult matter to make up the cost and delivery of gas in detail of costs of material, labour, &c., while comparing one company with another, inasmuch as information given us touching upon net cost of manufacture was confidential, and as each company has a different manner of figuring, we will, for the sake of comparison, presume that neither company has any annual surplus after paying the dividends, and so get at the supposed cost of gas to the company by deducting the amount of dividends and taxes *pro ratâ* per 1000 cubic feet from the average price of gas to the consumer. Thus, for the New York Mutual Company:—

	Dols.
20 per cent. dividends paid on capital, 2,500,000 dols. (paid in)	50 ,000
6 per cent. interest on bonds, 500,000 dols.	30,000
Taxes in New York, say	50,000
With delivery of 509 million cubic feet	580,000
Gives for each 1000 cubic feet sold	1 14
Average price for gas at 2·75 dols. per 1000 cubic feet, less 10 cents. per 1000 cubic feet for discounts, street lights	2 65
And we have the supposed cost per 1000 cubic feet	1 51

At the hearing before the Board of Aldermen in Boston, the evidence given by J. L. Kennedy, of the New York Mutual Company, confirms this result thus:—

	Dols.
Cost of coal per 1000 cubic feet	0 75
Labour	0 25
Distribution	0 20
Leakage, "which is high"	0 15
Taxes, 18 cents per 1000 cubic feet, would give 90,620 dols. in place of about 50,000 dols. cannel coal for enriching, per 1000 cubic feet	0 20
	1 73
Less residuals	0 23
	1 50

And from information in our possession we feel assured that the result is even more favourable than here represented; but we do not feel authorized to give further details in proof thereof.

(To be continued.)

Quality of the Newcastle-on-Tyne Gas.—Mr. John Pattinson reports the following as the results of his examinations for the month of February of the quality of the gas supplied to the borough by the Newcastle-upon-Tyne and Gateshead Gas Company:—

Date.	Illuminating Power in Sperm Candles.	Grains of Sulphur in 100 Cubic Feet of Gas.	Sulphuretted Hydrogen.
Feb. 2.	14·0	6·83	Nil.
„ 6.	14·4	6·84	„
„ 9.	13·9	5·56	„
„ 13.	14·9	9·15	„
„ 16.	14·6	7·87	„
„ 20.	14·5	9·12	„
„ 23.	14·3	8·18	„
„ 27.	14·1	6·88	„

A Sugg-Letheby standard Argand burner is used in testing. According to Act of Parliament the gas should not be of less than 14 standard candles illuminating power, nor contain more than 17 grains of sulphur per 100 cubic feet of gas.

MANCHESTER DISTRICT ASSOCIATION OF GAS ENGINEERS.

The Seventh Annual and Twenty-ninth Quarterly Meeting of the above Association was held at the Mitre Hotel, Cathedral Gates, Manchester, on Saturday, Feb. 24, at three p.m.—Mr. JOHN STORER, president, in the chair.

The minutes of previous meeting were read and confirmed, and the following gentlemen elected members, viz.:—

Mr. Joseph Hepworth, Gas Engineer . . . . . Carlisle.
„ W. A. Walker, „ „ . . . . . Elland.

The following report of the committee was then read:—

Gentlemen,—Your committee, in presenting their seventh annual report, have again the pleasure to state that the operations of the Association continue to be highly satisfactory.

During the past year we have had an increase of eight members, which brings our total strength to seventy, all of whom are *bonâ fide* engineers and managers of gas-works. The funds of the Association are in a very prosperous state, as will be seen from the statement of accounts which has been supplied to each member. The papers read during the past year have been of sterling excellence, and the committee tender their thanks to the members for good attendances, and also especially to those members who have contributed papers.

The thanks of all the members are especially due to the retiring president, John Storer, Esq., for the very efficient manner in which he has discharged his duties during his term of office, and also for the hospitable manner he entertained the members at their excursion to Alton Towers on Sept. 1, 1876.

At our May meeting the members accepted the invitation of Mr. Jacques, ex-president, to visit the Stockport Corporation Gas-Works, and also to inspect the plans of their new gas-works at Portwood. The members expressed their gratification at the inspection, and the thanks of the Association were given to Mr. Jacques for his kindness.

Your committee cannot conclude this report without expressing their deep sorrow at the death of Mr. Joseph Wood, the late engineer of the Bury Gas-Works. Mr. Wood was one of the pioneers of the British Association of Gas Managers, was a vice-president of the same, and also was the first president of our own association, and an active member to the time of his decease. The late Mr. Wood's sterling character, honesty of purpose, and true good-heartedness, endeared him to every member of our Association. By his departure from amongst us our Association lost a highly respected and valued member, and ourselves a faithful friend. "To know him was to love him."

The election of officers for 1877 resulted as follows:—

President—Mr. John Hutchinson, Barnsley.
Treasurer—Mr. James Paterson, Warrington.
Hon. Secretary—Mr. William Longworth, Dukinfield.
Three Members of Committee—Mr. Robert Hunter, Stalybridge. Mr. David Clarke, Ashton-under-Lyne. Mr. William Smith, Hyde.
Auditors—Mr. John Cockcroft, Littleborough. Mr. John Henry Lyon, Macclesfield.

The new PRESIDENT (Mr. John Hutchinson) having taken the chair, delivered the following address:—

Gentlemen—Having done me the honour of electing me to the office of President of the Manchester District Association of Gas Engineers for the present year, I beg to thank you most sincerely for the marked confidence you have unanimously shown in placing me in such a high position. I feel there are many gentlemen present who have charge of far larger gas undertakings than myself, and who, from their position and extended experience, are more eligible and likely to undertake, and successfully carry out, the duties devolving on this chair, than your humble servant. However, as it is your wish, I gladly accept this office of distinction, at the same time assuring you that during my term of office it will always be my aim and endeavour to so conduct your affairs, as to be creditable to myself, and practically useful to the members generally. Although I feel I am not the best possible person to deliver an address, I think most of you will give me credit for having the interest of the Association at heart.

In introducing the business before us, it becomes my duty to make a few remarks (which I will do as briefly as possible), principally with the view of calling the attention of the members to some little events now passing in the gas world, which may form interesting subjects for discussion; also to the utility and prosperous state of our own Association.

As regards the latter, I think we may safely congratulate ourselves on its increased popularity, and upon the interest taken in this local Association by gentlemen whose profession brings them into intimate connexion with all matters that relate to gas or gas undertakings. This will equally apply to the increase of members, and to the very satisfactory state of the funds, particulars of which have already been given in the report of the committee just read. All this tends to show the high esteem in which this and similar institutions are held by those interested in gas matters. Its practical value to its individual members cannot be over-rated, for it is well known that numerous young, hardworking, and aspiring gas managers have received much valuable information by being able to exchange ideas (often to their mutual advantage) with their brother members in other towns; and this has directly benefited their employers and the public. Nor should it be overlooked by the consumers of gas throughout the country that this constant communication and diffusion of technical knowledge, freely given to each other, must necessarily have an indirect, yet a very important influence on the general reduction in the price of gas, thus clearly benefiting the public.

Yet, while we notice the above gratifying facts connected with this Association, there are others that demand our attention. There are losses as well as gains to be taken into consideration. Gas engineers, like other mortals, cannot live for ever. I notice that, during the past year, we have lost one of our oldest and most esteemed members by death—I refer to the late Mr. Joseph Wood, engineer of the Bury Gas-Works. We all deeply feel the loss. His professional abilities were well known to be of the highest order. To his memory I think I cannot do better than quote a few words already in print: "Mr. Wood's sterling character and genial disposition secured for him the esteem of his professional brethren; to know him was to love him." He was in the 45th year of his age.

I often think if the public only knew what a gas manager in a large town has to undergo for their comfort—the constant daily and hourly application required of him, and the unrelaxing tension he is always under—they certainly would be more guarded and charitable in their remarks about that very useful, yet often abused, individual. Another thing I may mention. It is becoming the fashion to take over old and well-established gas undertakings into the hands of local authorities. This is commonly effected after sufficiently harassing the directors into a tacit consent, and the manager, after spending some 20 or 30 years of the best portion of his life in the honourable service of the gas company, is quietly set aside, or, if taken into consideration at all, it is at an estimated value similar to worn-out old grate-bars.

This is not at all as it should be. There are cases now on hand, and there may be some members here present who have suffered from these changes, and if this Association is of any real practical use at all, I think it should be to support and protect the mutual interest of each deserving member; and to take care that such an interference with his prospects in life should not be unnecessarily harsh, or be agreed to without due and ample compensation. I am sorry to see the occupation of a good and sterling old gas manager is rapidly becoming a thing of the past, as decision of character is nearly out of the question; there are so many deterring forces to contend against. For instance, in the new order of things, under local authorities, he cannot order, in some cases, even sixpennyworth of besoms, however urgently needed to keep the premises clean, without an order signed by the town-clerk, borough accountant, chairman, solicitor, and councillors. All this is very humiliating to an energetic, pushing man. And I think you will all agree it will be very detrimental to the interest of the consumer wherever persisted in. If an engineer or manager be appointed, let him maintain and fulfil his proper position, and then I have no hesitation in saying that the results will be much more satisfactory.

I may here notice that several interesting papers have been read during the past year by the members. Amongst these was one "On Proportional Capacity of Gas Apparatus," by Mr. Samuel Hunter. This was a paper of much interest to gas engineers, and is still on our books for discussion. I did hope that it would have taken place to-day, but I am informed that Mr. Hunter is unable to attend from ill-health. I also much regret the absence, from the same cause, of our worthy honorary secretary, Mr. W. Longworth, who is always ready and willing to give any assistance in his power.

I cannot pass over without mentioning the very numerous and extensive actual and proposed enlargements to many of the gas-works in the counties of Lancaster and York. This activity is the more remarkable considering the generally depressed state of trade.

I was much pleased to have the opportunity during the past year of inspecting the competing plans for the new gas-works of the Manchester Corporation, and was struck with the absence of any material change in the proposed apparatus depicted therein for rapidly generating gas. It was certainly a grand array of first-class drawings for works of great magnitude, the full particulars of which have been duly recorded in the JOURNAL OF GAS LIGHTING.

I wish also to notice Messrs. Körting Brothers Steam-Jet Gas-Exhausting Apparatus, which I am of opinion is really an acquisition to any modern gas-works. My friend, Mr. Whitaker, manager of the Wakefield Gas-Works, informs me that he has one now in full operation in conjunction with Messrs. Körting Brothers steam scrubber, and that he is very much pleased with it, demanding, as it does, no skilled labour on the part of the attendant, and only requiring the number of ports to be adjusted on setting down or putting on of additional retorts. He states very positively that by its use there is no decrease in the illuminating power of the gas, but a positive gain of one candle, which I find is confirmed by other engineers. The apparatus is coming into very general use, as it requires no attention after being adjusted, thus saving engine-men's wages, &c.

Messrs. Pelouze and Audouin's condenser appears a very admirable apparatus, and one which will commend itself from its comparatively small cost, and the very little space it occupies. I am not at present aware of one in operation in England, but if so, shall be glad to hear details respecting its practical working.

I have pleasure in bringing before your notice a model of a fastener for retort-doors, recently patented by our worthy ex-president, Mr. Storer. This fastener is certainly a step in the right direction, and its simplicity and efficiency will most surely tend to its adoption in every gas-works.

In conclusion, no doubt you will have observed an advertisement in the JOURNAL OF GAS LIGHTING for Feb. 20, 1877, page 279, in which it is stated that the indefatigable engineer, Mr. W. J. Warner, of the South Shields Gas Company, is about to inaugurate a public exhibition in that town of the most suitable and efficient apparatus for the application of gas to various domestic and other uses, such as cooking, &c., from the small requisites of a mechanic's home to the elaborate requirements of a gentleman's mansion; the heating of water, air, or other means of keeping hothouses properly heated by the most constant and easily regulated method; the application of gas for heating any room by open fireplace, &c.; and last, but not least, its use as a motive power. This, and similar exhibitions, including a collection of the best burners, are, I think, very much needed, and would, undoubtedly, do much to disabuse the public mind as to the supposed inferior quality of gas said to be supplied by some companies, the complaints in most cases being the direct result of the employment of very inferior burners. If the best class of appliances are made known, and become familiar to the public, they will be better appreciated, and day consumption encouraged. Mr. Warner desires me to say to the members of this Association that though the advertisement is addressed to manufacturers of apparatus, it is not intended to exclude any one from exhibiting any suitable apparatus coming within the range of the classes named. This movement is decidedly one in the right direction, and I wish it every success. The consumption in the above-named appliances, being mostly in the daytime, will be of still further benefit in utilizing our mains during a period when they are, as yet, little drawn upon.

I notice with much pleasure the daily-increasing sale of gas-engines (particularly those patented by Messrs. Otto, Langen, and Crossley), which are, without doubt, the cheapest and most handy motors at present in the market for powers from ½ to 3 horse.

With these few remarks, I now close my address, thanking you for the very patient and attentive hearing you have accorded to me.

Votes of thanks were accorded to the ex-president (Mr. Storer) and to all the other officers, and, on the conclusion of the business, the members sat down to an excellent tea, and a very pleasant evening was spent.

BURSLEM AND TUNSTALL GAS COMPANY.—An extraordinary general meeting of shareholders was held on the 1st inst. to "receive and decide upon the report of the committee appointed as per resolution passed on the 17th of January, 1876." Mr. A. Shaw, chairman, presided. The committee, in their report, recommended that in recognition of the valuable services of the directors and auditors, who had successfully carried the undertaking through times of great financial distress, and had brought it to its present position, the sum of £1600 should be awarded to them. The recommendation was agreed to.

PICKERING GAS AND WATER COMPANY.—The first annual meeting of this company was held on the 28th ult.—Mr. J. Watson in the chair. There had been a previous meeting of directors, when the tariff for supplying the water to the town was agreed to. The report was read by Mr. J. D. Whitehead, the secretary, from which it appears that the company are rapidly pushing forward their works, the pumping-engine having been erected, and the reservoir nearly ready, and the company will be able to supply the town with water in the course of a few weeks. The building of the gas-works has been commenced close to the North-Eastern Railway, and a siding laid down to the railway, and the company expect to be ready to supply the town from the new works before next winter. The chairman, in his opening remarks, said it had been found necessary to enlarge both the size of the gas-works and the reservoir, owing to the great number of applications the company had received from parties wishing to be supplied, and probably before the next meeting there would have to be a call of about £2 per share. The engine commenced to pump water into the reservoir on that morning, and during the day the hose was attached to the different fire-plugs in the town, and all were found to work satisfactorily.

GAS-GOVERNORS.

At an Ordinary Meeting of the Philosophical Society of Glasgow, held on the 21st ult., Mr. D. Bruce Peebles, engineer, Edinburgh, by special request, read a paper on "Gas-Governors, with Peebles's System of Controlling their Action." It was very fully illustrated by diagrams, apparatus, and by means of some beautiful experiments. As most of the facts and arguments embodied in Mr. Peebles's paper have already appeared in the pages of the Journal of Gas Lighting, it is not necessary that we should reproduce them on this occasion; we therefore content ourselves, by giving a summary of the discussion which followed the reading of the paper.

The Chairman (Dr. Andrew Fergus, one of the vice-presidents of the society) highly complimented Mr. Peebles on the great value of his paper, and on the beauty and convincing character of the experiments, and in the name of the society thanked him for the same. He then called upon

Dr. Wallace, Gas Examiner for the city, who opened the discussion. Having congratulated the lecturer on the interesting nature of his discourse, and the beauty of his demonstrations, remarked that it appeared to him that there were three points in Mr. Peebles's invention. First, there was the enclosure of the governor in an air or gas tight cylinder, doing away with the liability to accidental escape, which, by tilting, occasionally occurs with ordinary station-governors, sometimes attended with disastrous consequences. Secondly, the control of the governor was effected by a small instrument which could be placed at any distance without interfering with the certainty of the effect. Thirdly, the regulation was effected by means of a few weights, which were so small that they could be carried about in the waistcoat pocket, instead of by the ponderous counter-balances they had been accustomed to see in gas-works. As regarded the necessity for reducing the pressure in order to develop the illuminatlng power of coal gas, and to prevent unnecessary leakage, that had been amply demonstrated by Mr. Peebles.

Mr. Mayer said he had either read or heard that street-lamp regulators, of which Mr. Peebles had supplied some thousands to the Police Board of Glasgow, had been condemned by the authorities as being unreliable. If that was really the case, which he would be very sorry to learn, it would be well that they should hear the reason why. He was glad to see two members of the Town Council present, one of whom (Mr. Dron) was a member of the Corporation Gas Committee, and he thought it would be well if those gentlemen could state the facts of the case, and answer the question—"Why were the lamp regulators condemned, was it on account of proved inefficiency, or was it due to the fact that some other invention was to be favoured?" He said he might inform the society that there were no fewer than four gas managers present, all of whom should be asked to discuss the important subject brought forward by Mr. Peebles. Doubtless they were all well able to do so. They were—Mr. Stewart, of the Greenock Corporation Gas-Works; Mr. George Hislop, of Paisley; his brother, Mr. James Hislop, of the Partick, Hillhead, and Maryhill Gas-Works, who was a member of the society; and Mr. Key, manager of the Tradeston Station of the Glasgow Corporation Gas-Works.

The Chairman remarked that the society would be very glad to hear the opinions of all the gentlemen named, and he called upon

Mr. Samuel Stewart (Greenock), who said he had a very high opinion of Mr. Peebles's gas-governors. A great many governors had, from time to time, been introduced to the notice of the public, but he thought that of those now before gas managers, Mr. Peebles's was the best he had yet seen. It was evident, from the drawings before them, that although gas-governors had been brought out in which the gas had been applied on the upper side of the bell, to give the required pressure, yet in no case had that been so effectually done as with the governor invented by Mr. Peebles; and certainly they were entirely indebted to him for the very beautiful invention by which the larger governor could be controlled by a smaller one at any distance from it. That was an invention of the very greatest utility, not only in gas-works, but also in the houses of private consumers, and one that he anticipated would be largely adopted. He might add that he expected shortly to be able to introduce one of Mr. Peebles's governors into his works for controlling the gas supply of the town, as he had the greatest confidence in the mechanism. With respect to the necessity for using governors, Dr. Wallace had told the society, on a previous occasion, that "to consume gas efficiently it must be burnt at a very low pressure." The pressure thrown by the gasholders at the works from which the gas was supplied, was usually much in excess, and in order to check it station-governors were employed; but, notwithstanding, towns subject to great variations in level, such as Greenock, would occasionally have a very excessive pressure in some parts. Even in towns perfectly level, it was evident that, to give a sufficient supply to the outskirts of the town, those consumers near the works would be subject to a much greater gas pressure than was proper for the efficient combustion of the gas and to prevent waste. It was manifestly unfair that, because a consumer happened to live near the works, or in an elevated part of the town, he should be subject to a loss, arising from imperfect combustion, in consequence of excessive pressure. Hence arose the absolute necessity for having the gas supply all over a town, high and low, east and west, north and south, adjusted to a level pressure, which could only be done properly by district governors. But when the pressure had been rightly adjusted, it followed of necessity that, in order to give all the consumers a sufficient supply, there must be in every street a pressure in excess of that required for efficient combustion, and that must be controlled by means of a governor intelligently adjusted, and fixed on the meter of the gas consumer. The governor must be adjusted to a minimum pressure to give the required light when the maximum number of burners were lighted, and then, afterwards, the governor would control the gas supply so as to keep it at the minimum pressure, whatever might be the number of burners lighted, whether few or many.

Mr. James Deas, Memb. Inst. C.E., asked Mr. Stewart if he used district governors in Greenock?

Mr. Stewart replied that he did not. He had there a system of valves, and the mains in the higher levels had been proportionately reduced. He had also valves on each end of the mains in each street, which enabled him to keep the pressure very much under control. But it was evident that valves would only control the gas pressure effectually during the time of the maximum consumption, for the moment the consumption began to decrease, then the pressure would begin to increase on the outlet side of the valve until, as consumption fell off, it would equal that on the outlet side of the valve. The same thing happened when consumers turned the tap on the meter to suit their consumption of gas—an expedient which did very well for a time, until a number of the lights were turned out, when pressure began immediately to increase, until it reached something like that in the street. The only true remedy for excessive pressure was governors on the street mains and in consumers houses.

Mr. G. R. Hislop (Paisley) said he had very much pleasure in contributing his quota of general testimony in favour of Mr. Peebles's system of gas-governors. He was especially pleased with his patent station-governor, as represented in one of the drawings, and as proof of that fact he had already purchased several of them for country gas-works, which had, so far, afforded him entire satisfaction. In the scale of magnitude he had been advancing step by step, as it were, but he hoped to be able shortly to procure one for his own works, or, with the utmost confidence, recommend to others the use of such governors of any magnitude. With regard to Mr. Peebles's lamp-governors, he might say they had for some time had them in use in Paisley, and certainly nothing had occurred to give rise to any feeling of dissatisfaction in his mind (such as was hinted at by Mr. Mayer with regard to Glasgow), or resolution to discontinue their use. He was not informed as to how they were managed in Glasgow, or how long they had been in use as affecting their present condition; but, undoubtedly, governors were like other instruments or machines in being liable to get out of repair somewhat. They required occasional examination and readjustment, and if they received such overhauling at moderate intervals of time, it seemed to him to be all that was necessary; indeed, he was quite satisfied with the working of the governors referred to. Reverting to the station-governor, Mr. Hislop thought that it was a very beautiful arrangement, whereby the pressure upon the town was regulated and controlled by the initial pressure of the gasholder instead of by weights, and at any distance from it. On that account alone the governor was almost sure to gain favour and find general adoption, and he concluded by saying that he had much pleasure in having had the opportunity of expressing the favourable opinion which he had formed of it.

Mr. James Hislop (Maryhill) remarked that it was now more than a year since Mr. Peebles made him acquainted with his new patent station gas-governor. The bell was completely enclosed in an air-tight vessel, which was acted upon by the initial pressure of the gasholders, and the flow of gas was regulated in a very ingenious and most perfect manner by one of his patent house-governors, and in that way the station-governor was not affected by the variation of pressure in telescope gasholders, as was the case with nearly all the ordinary cone governors. He believed that Mr. Peebles had hit upon the only true method of constructing a gas-governor—one provided with an adjusting medium that was capable of being placed either upon it, or at any distance from it; and he had no hesitation in saying that it was to Mr. Peebles alone that they were indebted for the novel and all-important invention which that gentleman had brought under the notice of the society. On reflection, it occurred to him (Mr. James Hislop) that, with the adjusting medium referred to, a station-governor could now be looked upon in the light of a steamer upon a river—having its wheels or helm in various positions as found most suitable. The invaluable improvements described by Mr. Peebles might not be appreciated to their full extent for a little time, but he was quite confident that their value would soon be realized, and that the inventions would be adopted not only by all gas manufacturers, but also by the consumers of gas generally. He thought they ought to feel very grateful to Mr. Peebles for coming such a distance to exhibit so many elegant designs of gas-governors, and for the very instructive paper which he had delivered thereon.

Mr. W. R. W. Smith said that, with reference to the remarks made by Mr. Mayer regarding the street-lamp regulators in Glasgow, there were two sides to the question, and he felt induced to put forward the other side. He was one of three members of the Watching and Lighting Committee of the Police Board to whom had been remitted the duty of inquiring into the actual value of the lamp-regulators, and their fitness to discharge the duty expected of them. The sub-committee referred to had taken a walk through the streets one night, and had selected eight of the lamps from which they gave orders for the regulators to be removed and taken to Dr. Wallace to be examined and reported upon by him. He (Mr. Smith) understood that they were then all found to be inefficient for the performance of their duty. So far as he was himself concerned, he admired the invention very much; so much, indeed, that he had one in his own house, where he found it to work admirably, and he would strongly advise all other gas consumers to follow his example in that respect. But he thought that Mr. Peebles was not doing justice to himself in regard to the lamp-regulators. His opinion was that they suffered in their regulating power by being placed inside the lamps, where the heat was so great as to interfere with the quality of the leather forming the diaphragm of the regulator, and he urged the propriety of placing the regulators outside the lamps.

Mr. St. J. V. Day, C.E., said he had been particularly interested in Mr. Peebles's paper, and, in respect of the experimental illustrations of the effect of the system of controlling gas-governors, which Mr. Peebles had brought before the society, there could be but one opinion, and that a most favourable one. But, in regard to this question of controlling the action of a governor, Mr. Peebles seemed not to be aware of what had been done, a considerable time before the date of his own patent, in France. In his paper Mr. Peebles had shown that the proposal to control the action of the governor by admitting gas above the bell or diaphragm originated with Mr. Brothers, but Mr. Brothers admitted the gas from the inlet side. A little later Mr. Cathels devised a governor, in which the gas was admitted to act on the bell or diaphragm from the outlet side. In both of these cases the controlling gas was stationary, and varied with the inlet pressure in the former, and with the outlet pressure in the latter. Both of them were manifestly defective. But by letting a little gas flow continuously through a pipe into the chamber containing the bell, and providing that pipe with a stopcock, the area of opening in which could at any time be varied, it was obvious that any pressure requisite for the proper control of the governor at any time could be obtained in the bell chamber. He exceedingly regretted that it appeared from the tenor of Mr. Peebles's paper that Mr. Peebles was unaware this same method of control—viz., by the continuous flow of gas through a small pipe or orifice regulated by a stopcock—had been introduced by M. Giroud, the French gas engineer, who was well known in connexion with the beautiful rheometer bearing his name. He held in his hand M. Giroud's treatise, entitled "*De la pression du gaz d'éclairage et des moyens à employer pour la régulariser*," published so long ago as 1872, and at pages 72 and following of which, this method of control was fully described. Indeed, on Plate VIII. of that work, M. Giroud's governor (*valve souterraine*) was shown with the small passage for admitting the gas into, and the small pipe and stopcock for regulating its flow out of the bell chamber.

Mr. Dron remarked that the Gas Committee still had the matter of the lamp-regulators under consideration, and that in the meantime they had resolved on having several district governors, so as to assist in saving a large amount of the gas which was known to go to waste through leakage, owing partly to ill-regulated pressure on the mains, and which amounted in Glasgow to 18 or 19 per cent. It would be well, he thought, if Mr. Key, one of their station managers, whom he was glad to see present, would give the society the benefit of his opinions upon gas-governors. He understood Mr. Key was the inventor and patentee of one, and this showed that he had given very special attention to the subject under discussion.

Mr. James Hislop, in answer to Mr. Smith's remarks about the inefficiency of the street-lamp regulators, said he believed that the fault lay with the position in which the regulators were placed. The custom was to put them inside the globes or lamps; but some which he had fixed outside the lamps, in order to prevent the action of the heat upon the diaphragm, he had found to work well. In one of their districts (Hillhead), where a large number of the regulators were used, the same difficulty was experienced as that complained of in the city. He reminded the

authorities that the regulators had been placed inside the lamps, rather than outside, as he had advised. The answer was that the regulators were all inside the lamps in the city, and, therefore, the authorities thought that they were perfectly justified in supposing them to be right.

Dr. WALLACE remarked that out of the eight lamp-governors which had been submitted to him for examination, on behalf of the Watching and Lighting Committee, only five were of Mr. Peebles's manufacture, and that out of those five there were four which acted perfectly.

Mr. WILLIAM KEY (Tradeston Gas-Works) said that, in discussing the general duties of station gas-governors for street supply, they might lose sight of the leading and very important feature of the station-governor invented and described by Mr. Peebles. As shown on the diagram, that mechanism was designed to act as a safety-governor, to prevent serious accidents, such as had happened from time to time, causing the destruction of a large amount of valuable property, and the loss of several lives. Mr. Dron, in asking him to state his experience of gas-governors, had mentioned that he (Mr. Key) had patented a safety governor; but as it was not his governor that was under the consideration of the society, he would state what had happened to himself nearly three years ago, by way of showing the importance of making and using safety station-governors. While acting as manager for a gas and water company in England, one of his governors—a common one—which regulated the supply from one of the works, through a 15-inch pipe, was placed in a house having gauges to show the pressures, as also a gas-bracket on one of the walls. Small composition gas-tubes were led to these, and whether some acid had corroded one of the tubes, or a rat had cut it in quest of water, would always remain a matter of conjecture. However, during the early hours of a certain morning, gas escaped in the governor-room till it was filled by a very explosive mixture of air and gas. At 5.30 a.m. it was the duty of one of the men to go to that room and put on pressure by the governor for the morning consumption and supply of the mills, &c. Proceeding with an ordinary naked flame lamp on his usual round, on opening the door of the governor-room a terrific explosion took place, followed by an alarming blaze of gas. The bell of the governor was torn asunder at all the joints, and the cone and the weights detached. They might fancy what the scene was like, when he informed them that the gas got free vent into the atmosphere from a 15-inch pipe connected with the largest gasholder. As there were no means of turning off the gas from the holder, it blazed in a terrific manner till it was gradually got under by filling the gas-main with water, by playing a fire-hose pipe into it, and by buckets at another point. He (Mr. Key) must express the opinion that such gas-governors as the one shown upon the diagram, marked "Ordinary Governor," would soon be reckoned as things of the past, as he believed that no thoughful and prudent gas manager would adopt, at the present day, any governor for his gas-works but such as was arranged, so that large volumes of gas could not escape, even should the bell be destroyed or tilted. It had been remarked, by a previous speaker, that the system of regulating and putting pressure on large governors, adopted by Mr. Peebles, had previously been invented and patented in France. Should that be the case, and even should other parts of the governor have been formerly invented, still he thought it was to Mr. Peebles that was due the credit of having designed and brought about such beautiful results, by arranging the whole of the parts in such a way as, he was sure, had never previously been brought before the public. Mr. Peebles had succeeded in making a fine instrument—one which, it was to be hoped, would not be too fine for practical working. He might say that in his experience it was necessary to examine and readjust every lamp-governor once a year, using for that purpose a graduated 5-feet gasholder, such as had been used by Mr. Peebles in his experiments. Possibly the reason why Dr. Wallace found one-half of the governors which he had examined in a good, and the other half in a bad condition, was that the latter had been fixed and left unexamined for a number of years. If Mr. Peebles directed his attention to the production of a lamp-governor such as had already been spoken about, in the same way as he had done with the large governor, which took him five years to bring to such perfection, he (Mr. Key) had no doubt that he would be successful.

Mr. PEEBLES replied at some length. He said he would prefer not to say anything about the governors in the Glasgow street-lamps, as that might savour of "shop," which he did not wish to talk before such an audience. Still, it was desirable that he should make a remark or two on that subject. With reference to what Mr. Smith had stated, he would remark that it was just possible that some of the lamp-regulators had been found out of order, and not fulfilling their functions aright; but it should be remembered that there were amongst them some of the earliest that were made by his firm, and that they had now greatly improved upon the original form. Furthermore, it was possible that the Gas Committee's workmen, who had examined the regulators complained of, had not been careful as to the kind of leather which they had used for the new diaphragms, or the kind of oil with which the leathers were treated. Referring to the remarks of a previous speaker, on M. Giroud's inventions, he said he knew the rheometer well, and he had no hesitation in characterizing it as a beautiful instrument. Whether or not it was a perfect instrument was another thing. He had been called upon to substitute a number of his own most improved lamp-regulators for Giroud's rheometers, which he thought was a fact that told in favour of the former. However, if the street-lamp regulators in Glasgow were not found to be reliable in use, he would say by all means get quit of them, particularly if Giroud's or any others were better than his, and would stand well for six or eight months, or a longer time. Notwithstanding what had been said by Mr. Day regarding the alleged priority of Giroud's invention over his district governor, he held that his invention was altogether independent of that referred to.

After Mr. Peebles had thanked the society for giving him such a patient hearing, and for the complimentary remarks made regarding his inventions, the proceedings terminated.

IRON AND COAL TRADES OF SHEFFIELD, SOUTH YORKSHIRE, AND NORTH DERBYSHIRE.

(FROM OUR OWN CORRESPONDENT.)

There has been no change of any importance during the past week in connexion with the iron trade or its allied industries, except that in several respects there has been a somewhat more marked depression. This dulness has been intensified by the stoppage which has occurred at Wakefield, and by the rumours which prevail as to the stability of two or three firms in this district. In the pig iron trade there is considerable weakness in prices, and a general inclination on the part of vendors to accept rather less money for deliveries in the immediate future, although some of them may not be inclined to enter into forward contracts on the same basis. The drop averages 1s. 6d. to 2s. on certain brands of pig, and for the most part affects forge pig of Yorkshire, Lincolnshire, and some classes of Derbyshire brands. This tendency is also increased by the low tone of the Scotch pig iron market, and by the considerable increase of stocks in other districts.

In consequence of this state of things there is a proportionate weakness in the quotations for castings of all kinds, including pipes for gas and water purposes, which may just now be bought to advantage. Despite this current depression, however, many persons in the trade have an idea that there will be an improvement all round after Easter, with an attendant hardening of prices. This view is to a certain extent confirmed by the comparative activity of the Bessemer steel trade here and elsewhere.

In the merchant iron departments the amount of business doing is exceedingly limited, the production being now mostly hoops of special brands, bars for steel converting, and a few lots of plates for ship and other purposes.

There is very little alteration in the general condition of the fuel market, which remains dull in every direction. All the larger sorts of coal are neglected, whether for household or other purposes, a fact which, nevertheless, results unfavourably for those who have to use small slack for engine uses. This slack is now becoming very scarce, and is being held at rather more money by both colliery owners and merchants. At present it ranges from 3s. to 6s. per ton at the pits, but I hear of a lot of 1100 tons being sold here at slightly over the higher of these rates.

THE LANCASHIRE COAL AND IRON TRADES.

(FROM OUR OWN CORRESPONDENT.)

With the exception that the more winterly weather of the last couple of weeks or so has caused a better demand for house-fire classes of coal, there is not much change to notice in the condition of trade in this district. In coals for gas making purposes there is very little doing beyond what is required for the supply of contracts. Common coals still move off only very slowly, the demands both for ironmaking purposes and shipping, being extremely small. There has, however, been a little more going off for export, and some of the large steamship companies have been taking rather more steam coal recently, but notwithstanding this, both the coasting and the foreign trades are very much below the average, and the complaint is that coalowners in other districts, where wages have been reduced more nearly to the old level, have an advantage over the Lancashire colliery proprietors, who are still paying a comparatively high rate of wages, considering the prices now ruling in the market, and are therefore losing a great deal of their legitimate trade, the Lancashire coasting trade having fallen off fully 50 per cent., whilst many of the foreign markets are being supplied from cheaper sources, chiefly Yorkshire and the North of England. For slack, prices continue stiff, but as common classes of burgy are a drug in the market, there is a disposition amongst consumers to fall back upon this description of fuel, rather than pay more money for slack. The average pit prices remain much about as under:—Arley, 9s. 6d. to 10s. 6d.; Pemberton four-feet, 8s. 6d. to 9s. 6d.; common coal, 6s. 6d. to 7s. 6d.; burgy, 5s. to 5s. 6d.; and slack, 3s. 6d. to 4s. 6d. per ton. Supplies, however, are generally abundant in the market, and there is a good deal of underselling to secure orders, especially in the common classes of coal.

The iron trade is without improvement, and the demand continues exceedingly limited, whilst north country iron is offered in this district at such extremely low prices, that the local makers are still completely shut out of the market; Middlesbrough foundry pig iron, delivered here, being offered at 52s. 6d. per ton, whilst local makers will not take less than 56s. to 57s., less 2½ per cent. In the finished iron trade there is no material change; works, as a rule, are still only going from hand to mouth, but quotations remain at £6 15s. to £6 17s. 6d. for Lancashire, Middlesbrough, and Sheffield bars, and £7 for Staffordshire ditto, delivered into the Manchester district.

THE COAL AND GENERAL TRADE OF THE NORTH.

(FROM OUR OWN CORRESPONDENT.)

The coal trade of the North of England is not materially changed. As reported last week, the appearance of cold weather had tended to make the house coals firmer. That has been maintained, and prices have been a little better. The demand for best gas coal is pretty regular, and prices ranging from 8s. to 9s. per ton, less 2½ per cent. discount, may be deemed the regular quotation. The demand for medium qualities of gas coals can only be deemed poor. It is a sort of coal which is very abundant in the market, and as the difference between best and medium is only about 1s. a ton, and as the cost of freight is about the same, the gas companies prefer best. Manufacturing coals and coke are in very little demand. The iron trade is extremely dull, and so long as it is so there will be no revival of business in second-class coals of any kind. Prices are extremely low. The steam coal trade shows no improvement. If anything, prices are a little worse, the pits, without exception, are working short time, and a considerable number of pitmen remain out of employment.

Rates are a little higher to London. Steamers were stopped by the rough weather a couple of days last week, but, upon the whole, trade in seaborne coal has been pretty open. The shipments would not be short of an average for the week. Freighting amongst small coasting sailing ships has been limited. There have been few offers from merchants except at low rates. Little is comparatively doing for the Sound ports and the lower ports of the Baltic.

A good deal of pig iron has been shipped to the Continent, and as far away as California. Machinery and other work is also being placed aboard steamers to go abroad, but there is not a very great business in that direction. The fire-brick trade to France and Germany is rather dull.

TRADE NOTES FROM SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

The inhabitants of Pathhead and Ford, near Kirkcaldy, in Fifeshire, have recently been considering the propriety of having a gas supply undertaking of their own. Colonel Dewar, of Vagrie, has offered ground on a suitable site for the erection of the gas-works, and a committee have been appointed to institute inquiry as to the probable cost of such an undertaking as is contemplated, the views of the proprietors in the district, and the likelihood of their taking shares and becoming consumers.

In the Burgh of Armadale, near Bathgate, there are loud complaints as to the quality and price of the gas, as the town is in the centre of a district which can boast of an abundant deposit of gas coal. It is, naturally enough, alleged that if any gas company can manufacture gas with economy it is that of Armadale. The directors are strongly urged both to lower the price and raise the quality of the gas. Unless they do so, it is proposed to call a meeting of gas consumers, and elect a committee having the power to appoint what the miners call a "justiceman," whose duty will be to keep a daily register of the quality of the gas, and to inspect the indexes of the meters when requested to do so. It is thought that there will be no difficulty in obtaining the necessary funds to pay the "justiceman."

The last examination of the Edinburgh Company's gas showed an illuminating power of 28·26 candles, that of the Leith Company being 26·65 candles.

At the usual monthly meeting of the Town Council of Glasgow, held last Thursday, there were submitted the minutes of the Corporation Gas Committee, which set forth that there had been under the consideration of the committee a scheme proposed by Mr. Foulis for dividing the city into districts, and putting down a governor in each of them, in order to regulate the pressure over the area embraced within each district. After full deliberation, the sub-committee resolved to instruct Mr. Foulis, as an experiment of the scheme referred to, at once to proceed with the formation of Pollockshields and neighbourhood into a district, and to regulate

the pressure over the same by a governor put down at the Tradeston Gas-Works. Further, they resolved that after the experiment had been tested in that district they should visit the same, and thereafter consider what report they should make to the Works Committee on the subject. Mr. Foulis stated that the cost of making the experiment in the Pollockshields district would not exceed £60.

The Finance and Gas Committees of the Glasgow Town Council have had the following motion remitted to them, on which they are to report:—"That, recognizing the great importance of providing open spaces or squares in the centre of the city, for the benefit of those residing in closely-built localities, we remit to the Finance Committee to consider and report on the propriety of arranging with the Gas Committee for securing the whole or part of the ground lately occupied by the Townhead Gas-Works, for the purpose of forming a public square to be suitably laid out." In the course of the discussion which took place upon the motion, the Lord Provost said that, by the Gas Act, any profits derived from the sale of gas could be applied to corporation purposes, and that it would be a graceful thing on the part of the Gas Committee to make a gift of the ground. Bailie Collins who proposed the motion, said he thought that he would be able to show the committee that the proposed square could be made without almost any additional cost to the city, the idea being to feu the eastern portion of the eastern boundary fronting High Street. For this a considerable sum would be realized, and there would still remain behind a larger space than that comprised in George Square, which might be laid out at a moderate cost to the Corporation..

The Aberdeen Corporation Gas Commissioners, on the recommendation of their Gas Committee, have resolved to erect a new station-meter at the gas-works, at a cost of £448, which was the lowest offer. The contract has been secured by Messrs. James Milne and Son, gas-meter manufacturers, Edinburgh. According to the estimates of the Gas Committee, the cost of re-roofing the purifier-house of the gas-works will be £700—namely, £525 to Messrs. Blackie Brothers, for ironwork, and £175 to Mr. W. W. Milne, for slater-work.

Dundee has just been "exercised" regarding the question of lighting common stairs and private courts. The Police Commissioners had asked the Gas Commissioners to insert, in their Bill now before Parliament, a clause relating to that subject; but, notwithstanding that the first-named body had decided on taking the onus of the arrangements, the Gas Commissioners were not satisfied that it was in their province to take such action as had been suggested, and they told the Police Commissioners to go to Parliament themselves for the powers which they desired.

Rapid progress is being made with the new water-works for the town of Galashiels, both in the construction of reservoirs at Knowes Dean and Stantling Crag, and in the distributing arrangements.

The Elgin Police Commissioners have resolved to borrow £14,000 from the Public Works Loan Commissioners, to defray the expense of the local water-works.

Operations are to commence at once in connexion with the new water supply works for the town of Bathgate.

Messrs. J. and A. Leslie, C.E., have reported to the Dundee Water Commissioners that the Clatto reservoir is completed, and they recommend that the year of maintenance should reckon from the day when the water was admitted—namely, the 16th of December last.

The local authority of Newburgh, Fifeshire, have resolved to proceed with a new water supply scheme, from plans devised by Mr. Storrar, C.E., Cupar.

A hitch seems to have occurred in regard to commencing operations for the construction of the new water-works for Wemyss, Fifeshire. Labourers were expecting to be employed at the works before this time, but the ground still remains unbroken.

The villagers of Fowlis Wester have lately been endeavouring to raise funds to carry out a proposed water supply scheme. The lord of the manor (Mr. C. H. D. Moray, of Abercairny) has given instructions to proceed with the undertaking, and has intimated that he will pay the sum required to complete the works.

Plans are now prepared for proceeding with the construction of the store reservoir, required as part of the new water supply works for Dunfermline. There will be about 150,000 cubic yards of earthwork and clay puddle to execute.

On the 7th inst., Glasgow Corporation Water Annuities realized 10s. above the former quotation at 103½.

The pig iron warrant market suffered several falls in prices during the past week, which closed at 10d. lower than the closing price of the previous Friday. As low as 54s. 1½d. was taken on Friday afternoon. Several makers have reduced their quotations.

No change of any importance has taken place in the coal trade, and business is extremely dull. Local demand is quiet, and house descriptions are becoming increasingly slow of sale, the advance of the spring season evidently contracting the demand. Prices, however, remain steady.

Death of a Veteran.—Joseph Naylor, ex-foreman of the Cork Gas-Works, died at Cork last week, at the advanced age of 81. He was the first man who charged a retort in Cork 52 years ago. He was previously employed, as early as 1810, at the Peter Street works of the Chartered Gas Company at Westminster.

Ripley Gas and Water Works Company.—The statement of accounts presented at the annual meeting showed that during the past year there had been expended on capital account £436 3s. 7d., making a total outlay of £9976 8s. 11½d. The revenue for the year was £2445 15s. 2½d.; the payments, £1567 12s. 10½d. This admitted of a dividend of 9s. per share, and the directors recommended that dividend, which was accordingly declared.

Sales of Gas and Water Shares.—Twenty £10 shares, D Preference Stock, in the Sheffield Water-Works Company, were sold by auction on the 20th ult., and realized £11 2s. 6d. per share. At Longton, on the 2nd inst., £150 Consolidated Stock in the Stoke, Fenton, and Longton Gas Company, was sold by auction, and realized £313. At Norwich, on the 5th inst., 30 shares, at £20 each, in the British Gaslight Company, realized on an average £41 15s. 10s. per share.

Quality of the Glasgow Gas.—The following is the report on the illuminating power of the gas supplied in Glasgow during the week ending March 3:—

	St. George's Cross.	Alston Street.	West Street.	Hillhead Street.
Illuminating power, average	24·93	26·89	26·14	26·25
" " maximum	26·46	29·12	27·98	26·74
" " minimum	23·07	25·49	25·00	25·51
Number of days below 25 candles,	3	—	—	—

Newcastle and District Association of Foremen Engineers and Mechanical Draughtsmen.—We learn that at a general meeting of this association on the 3rd inst., Mr. W. J. Warner, the engineer of the South Shields Gas-Works, was unanimously elected as a life honorary member, as a token of the respect and esteem the members entertain toward him. We congratulate Mr. Warner on the distinction so spontaneously and cordially conferred upon him.

Tenterden Gas Company.—At the annual meeting of shareholders the accounts showed a balance of profit of £523 3s. 8d., including stock in hand, and a dividend of £6 per cent., free of income-tax, was declared, leaving a sum of £270 1s. 8d. to be carried to the account. The sum of £100 was ordered to be paid off the loan borrowed some time back. The price of gas it was decided should be reduced from 6s. 8d. to 5s. 10d. The chairman pointed out that the company stood now in an improved position to that occupied when the great advance in coal took place two or three years ago, but the expenditure in the present year would be augmented in consequence of new retorts having to be fitted.

Narborough Gas Company, Limited.—The annual meeting was held on the 20th ult.—Mr. J. Simpkin in the chair. The directors in their report congratulate the shareholders upon the continued prosperity of the company; sincerely regretted the deaths, during the year, of two of their colleagues—viz., the Rev. H. J. Hoskyns and Mr. John F. Johnson; referred to the concession made to consumers at Midsummer last, by allowing a discount for prompt payment and reducing the price of coke; stated with pleasure that they had added to the reserve-fund £113, though expenses had been very heavy; and recommended a dividend for the half year ended the 31st of December last, at the rate of 5 per cent. per annum, free of income-tax.

European Gas Company, Limited.—An extraordinary meeting of the shareholders of this company was held on Wednesday, March 7, at the offices, 11, Austin Friars, London—Wm. White, Esq., in the chair. The object of the meeting was to elect a director in the place of the late Mr. Walter Thomas Fawcett, deceased. There were four candidates, but Mr. Backler announced that he was requested by Mr. E. T. E. Besley to withdraw his name on this occasion. A poll was taken in the interest of Messrs. G. Harrison, H. J. Baddeley, and E. Garey, and, after an animated conversation, the chairman declared Mr. H. J. Baddeley to have the largest number of votes recorded in his favour. Mr. H. J. Baddeley returned thanks for his election, and a vote of thanks to the chairman brought the proceedings to a close.

Wimbledon Gas Supply.—There has been a good deal of grumbling in the neighbourhood of Mitcham, Merton, and Wimbledon of late in reference to the quality of the gas supplied in the district, and at a meeting of the Wimbledon Local Board on the 7th inst., the following resolution was adopted:—"That, while the members of this board would regret being compelled to take steps in any degree hostile to the Mitcham and Wimbledon Gas Company, they cannot but concur with the petition of influential ratepayers now before them, and they trust the directors will be induced to give effect to the wishes expressed in such petition—viz., the reduction in price and improvement in quality." It was further resolved that a copy of the resolution should be forwarded to the vestries of Merton and Mitcham, with a request for similar action on their part.

Reductions in the Price of Gas.—The Hereford Town Council, on the recommendation of their Gas Management Committee, have agreed to reduce the price of gas to private consumers from 4s. to 3s. 9d. per 1000, and the public lamps 6d. per 1000. At Tenterden, the price to private consumers has been reduced from 6s. 8d. to 5s. 10d. At Bromley, the price will be reduced from 4s. 6d. to 4s. 2d. The Salford Town Council, at their meeting on the 7th inst., resolved—"That, after the quarter ending the 30th of June next, the price of gas shall be reduced to the following scale of charges:—Consumers of 250,000 cubic feet within the borough, 3s. 8d. per 1000 cubic feet; ordinary consumers within the borough, 3s. 9d. per 1000 cubic feet; consumers beyond the borough, and within a radius of five miles from the Regent Road Gas-Works, 4s. 3d. per 1000 cubic feet; and consumers beyond such radius, 4s. 8d. per 1000 cubic feet.

New Gas and Water Companies.—During the month of February the following new companies were registered:—*South Hayling Gaslight and Coal.*—With a capital of £4000 in £5 shares, for purchasing certain gas-works in course of erection belonging to Mr. Henry Skoines, of 7, Argyle Street, St. Pancras, for supplying gas and gas products to the inhabitants of the Island of Hayling, Hampshire. *Hengoed Gas and Water.*—With a capital of £5000 in £5 shares, for carrying on the business of a gas company at Hengoed, Maesycwmmer, Ystrad, Fleur-de-Lis, and Pengam, in the counties of Glamorgan and Monmouth; and also to carry on the business of a water company at Hengoed and Maesycwmmer, and places adjacent thereto. *Colne Valley Gas, Drysaltery, and Manufacturing.*—With a capital of £40,000 in £5 shares, for taking over the business and property of the Colne Valley Gas Company, Limited; also to carry on the business of cutters, manufacturers, and dealers in longwood, chemicals, and chemical products; and also to spin and manufacture textile fabrics.

Death of Mr. William Fraser, of Inverkeithing.—Our readers will learn with regret of the almost sudden death of this gentleman on the afternoon of Sunday, the 4th inst. The *Glasgow Herald* says that Mr. Fraser had been ailing slightly for several days previous, but was able to give the usual attention to business, and up till Saturday evening nothing of a serious nature was apprehended. About midnight, however, he was seized with inflammation of the heart, and became rapidly worse till he expired in the course of the following day. Mr. Fraser, who was in his 64th year, was the son of the late Rev. William Fraser, minister of the 2nd U.P. congregation, Alloa, and brother of the Rev. Erskine Fraser, Langside, Glasgow. He was bred to the legal profession in the office of Mr. James Peddie, W.S., Edinburgh, from whence he went to Cupar, but the situation of town-clerk at Inverkeithing having become vacant, he received the appointment, the duties of which he has fulfilled for a period of 38 years. He was instrumental in establishing the first banking office in Inverkeithing in connexion with the Eastern Bank of Dundee, which sometime afterwards became a branch of the Clydesdale Bank, and since then it has been the only bank in town. He held a number of important positions of trust and responsibility, and took an active interest in several neighbouring industries, being for many years one of the principal partners of the Halbeath Coal Company, and also the proprietor of an extensive brickwork on the north side of the town. He was a shrewd business man, possessing remarkable energy and industry, and he was readily consulted by people in the district, who highly estimated his sagacity and judgment in all matters pertaining to his profession.

Wakefield Water-Works Company.—The ordinary half-yearly meeting was held on the 26th ult.—Alderman Connor presiding. The Chairman, in opening the proceedings, said the only business they had to transact was to affix the seal of the company to the register, and to pass the half-yearly accounts. The shareholders were aware that the company had no dividend to declare, as, instead of dividend, the corporation, who had decided to purchase the works, had to pay interest on the capital up to December last. It was thought the company would not have had occasion to meet again; but on reference to the Act it was found that, until the transfer actually took place, it would be necessary for them to hold half-yearly meetings for the same purpose as that for which they met that day. In all probability they might have another meeting like that to attend, or perhaps not. He believed every gentleman had been furnished with a copy of the accounts, and he did not think it would be necessary for him to go through the items, or for the accounts to be read. He thought they might take them as read, and if they were all of that opinion, he would

propose that the balance-sheet should be adopted. Mr. George Haldane, one of the directors, seconded the motion. Mr. G. V. Ellerton said he supposed the purchase of the company's works by the corporation would not be completed until the Improvement Bill had passed. The Chairman said that was so. He might also say that the detailed agreement which was entered into between the corporation and the company had been sealed and signed, and he believed there was no doubt as to the Act being passed, as there was practically no opposition to it.

The Gas Question at Bishop Auckland.—On Monday, the 5th inst., at the Bishop Auckland Town-Hall, Mr. Harrison, one of the inspectors of the Local Government Board, sat to hear evidence in connexion with an application which had been made by the Urban Sanitary Authority, for a Provisional Order to enable the authority to supply gas to the district. Mr. Proud entered into a long history of the proceedings of the board in reference to the gas question, stating that power had been given by the board to the Gas Lighting Committee to enter into negotiations with the present gas company for the purchase of their works. The company, in the first instance, stated their willingness to sell, and when the Urban Authority notified their intention to apply to the Local Government Board for a Provisional Order, they then said they would not sell. Mr. Proud, as chairman of the Lighting Committee, Mr. Thornton, clerk, and Mr. Lindsay, the surveyor of the local board, gave evidence bearing out this statement. Mr. Hepworth, gas engineer to the Corporation of Carlisle, and Mr. W. Smith, engineer of the Darlington Gas-Works, were examined at considerable length as to the condition, efficiency, and value of the present gas-works. Their evidence was to the effect that the company's plant was of a very primitive description, the gas very imperfectly purified, and the works altogether inadequate to the supply of a town's population with gas. Messrs. J. Armstrong, R. Harborn, and William Allan, were also examined in regard to the dissatisfaction which had existed at various times with the gas company. At the close of the evidence, the commissioner said it was his own conviction that the gas-works should be in the hands of the Urban Authority, but that had nothing to do with the present inquiry, the facts of which he should simply lay before the Local Government Board.

Salford Corporation Gas Supply.—At the meeting of the council on the 7th inst., it was stated that the Gas Committee, in order to afford every convenience for, and ensuring prompt and proper attention to, gas consumers in or near Eccles, had resolved that a workshop and house should be taken in Eccles, and a servant of the corporation placed therein, rent free, and furnished with tools, fittings, stock, and books requisite for the performance of the necessary work, under the superintendence of the engineer. The council resolved to accept the tender of Mr. William Healey for the erection of a new purifier-house for the sum of £6947 10s., and the tender of Messrs. Adam Woodward and Sons for the supply and fixing of the lifting machinery for the purifier-lids and oxide for the sum of £1590. Mr. Sharp, the chairman of the Gas Committee, moved the following resolution:—"That the price of gas be reduced to the following scale of charges after the quarter ending the 30th of June next—viz., to consumers of 250,000 cubic feet within the borough, 3s. 8d. per 1000 cubic feet; to ordinary consumers within the borough, 3s. 9d. per 1000 cubic feet; to ordinary consumers beyond the borough, and within a radius of five miles from Regent Road Gas-Works, 4s. 3d. per 1000 cubic feet; to ordinary consumers beyond such radius, 4s. 8d. per 1000 cubic feet." Alderman Dewhurst seconded the resolution, and Mr. James Johnson remarked that he hoped the small concession in price now made was only the forerunner of larger concessions. Mr. Mather trusted that those who desired a reduction in price would keep in view the large expenditure required to put the works in order. They were sadly out of order now, and every endeavour was being made to get them in proper trim, after which the price of gas might probably be gradually reduced. The motion was carried unanimously.

Longton Gas Company.—The half-yearly general meeting of shareholders was held on the 26th ult.—Mr. W. Webberley in the chair. The company's engineer and manager, Mr. J. M. Darwin, presented the report of the directors, which was as follows:—"The directors have to report that during the past half year it has been found necessary to expend a larger sum than usual in the maintenance of plant, and that having undertaken a systematic examination and testing of the company's mains and meters, a larger amount will be found to have been expended under these heads of account. The sewerage operations of the corporation have interfered very materially with the smaller mains of the company, and considerably increased the leakage account. Most of these mains, although sufficient for the supply of the districts in which they were laid, yet after being disturbed it has been found necessary to take them up, and larger and stronger pipes have been laid to prevent breakage or other damage. A new valuation of the company's undertaking has been made for parish purposes, and the new assessment is nearly treble the amount of the former valuation. After the last half-yearly general meeting an extraordinary meeting of the shareholders was held, in accordance with the notice duly given, to consider the propriety of extending the time for the completion of the sale of the works, and also to consider the terms on which such extension should be granted. It was resolved at this meeting, and has since been agreed to by the corporation, that the purchase-money of the share capital should be increased from £66,000 to £70,000, the corporation, as before, taking also the mortgage debt of £3150. The last issue of £5000 share capital will now rank with the ordinary 7 per cent. capital, and the dividend of 5 per cent. paid on this capital is increased to 7 per cent. The directors recommend that the following dividends be declared at the half-yearly general meeting—viz.: 10 per cent. on the original, and 7 per cent. on the ordinary 7 per cent. and ordinary shares; and also that the difference of dividends from 5 to 7 per cent. be paid for the half years ending Dec. 31, 1875, and June 30, 1876, on the amounts then called up. The balance brought forward from the half year ending June 30 last was £957 7s. 7d., the profit of the past half year being £1935 15s. 4d. After payment of interest on mortgages and dividends, amounting to £1761 15s. 8d., there will remain a balance of £1053 5s. 4d. to be carried forward to the next half year's account. The corporation, finding they could not succeed in obtaining satisfactory powers from the Local Government Board for the purchase of the whole of the undertaking of the company, are now promoting a Bill in Parliament in accordance with the new terms of purchase agreed to by both parties." The report was adopted, and the usual dividends declared.

Maidstone Water-Works Company.—The report of the directors presented to the annual meeting of shareholders, on the 26th ult., was as follows:—For the quarter ended on the 31st day of March last, the company received for water-rent, £1077 2s. 7d.; for the quarter ended the 30th of June last, £1103 0s. 5d.; and for that which ended on the 30th of September last, £1140 9s. 2d. The rents for the quarter which ended on the 31st of December, 1876, are estimated to realize about £1150. The amount of water-rents for the year which ended on the 31st of December, 1876, will, therefore, be about £4470. Taking into account the amount of water-rents due for the quarter which ended on the 31st of December last, the amount due from customers on the trade account, and the value of the stock of coals and materials in hand, the directors estimate that there was a profit for the year of about £1366, this being a clear income of more than 6½ per cent. upon the ordinary share capital of the company—a result upon which the directors think the shareholders may fairly be congratulated. The directors propose to recommend to the shareholders at the present meeting that a dividend of £4 10s. per cent. per annum, free from income-tax, upon the ordinary share capital of the company, should be declared, such dividend to be payable on the 1st of May next. This will absorb £900 of the profits of the year, and the directors propose that the balance of £466 12s. 11d. be carried to the reserve-fund, which will then amount to £656 10s., out of which the directors propose to pay the cost of supplying three new pumps, and repairing and strengthening three old pumps at the company's works. During the year 1876 the directors have received £250 further capital by the issue of twenty-five £10 preference shares, at an interest of £5 per cent. During the past year, besides extension of mains in a few new streets, the following works have been performed:—1. The taking up of about 540 yards of 6-inch pipes along the line of the South-Eastern Railway, and replacing them by 9-inch pipes. This work was found to be necessary in consequence of the 6-inch pipes having been found of insufficient size to convey the water from Tutsham, in addition to the small supply for which the 6-inch pipes were originally laid down. The cost of this work was about £370, against which may be set off the value of the 6-inch pipes removed, estimated at about £70, and which pipes may at some time be useful on the company's works. 2. At a very small cost to the company, the mode of supplying with water the County Lunatic Asylum has been very greatly improved by the Asylum Committee supplying a new pipe of larger bore from the company's works to an enlarged reservoir at the asylum. These works were done by the committee, and the consequence of this has been that the cost of pumping the water from the company's works to the asylum has been considerably reduced. 3. It having been found by the directors that the company's pumps, which had been in use for fifteen years, were out of repair, and in consequence of which there was a great loss of water in pumping, the directors resolved that they would effect a complete restoration of the pumps. This work has been recently finished. By operating upon the pumps connected with each of the two engines separately, the work, though longer in hand, has been done without accident, and without interfering in any way with the supply of water to the town. Three new pumps have been put in, and the remaining three have been repaired and strengthened. These repairs and restorations have been found to decrease the time employed in pumping, and thereby to effect a saving in the consumption of coals. The cost of these works has been £482 9s. 10d., which sum the directors, as before stated, propose to pay out of the reserve-fund.

Register of New Patents.

1071.—Miller, A., Glasgow, "*A new or improved construction of pump or fluid drawing and forcing apparatus.*" Provisional protection only obtained. Dated March 11, 1876.

This invention consists in a reciprocating cylinder or barrel pump, with stationary outer radial pistons or plungers on the inner end of their stems, made hollow for the fluid to be drawn in and forced out through them as the barrels are reciprocated on the pistons. The back or outer ends of the stems or pipes are attached to an outer pipe common to, and opening into, all the hollow pistons and their barrels.

1074.—Saville, G. E., Sowerby Bridge, "*An improved gas scrubber or washer.*" Patent dated March 11, 1876.

This invention was described and illustrated in the Journal for Jan. 9, page 58.

1108.—Boulton, M. P. W., Tew Park, Oxford, "*Improvements in apparatus for producing heat by the combustion of inflammable gases or vapours, and for generating the latter.*" Patent dated March 15, 1876.

This invention relates to apparatus for the mixing and burning of gas or inflammable vapour with air, or with any gas or elastic fluid capable of supporting combustion, and also to apparatus for generating inflammable vapour.

Where gas is burnt with common air, the gas issues in a jet from a tube or nozzle of ordinary form, into a conical passage converging in the direction of the movement of the gas. A stream of air enters through the passage into the space around the gas-jet, and in virtue of the conical form of the passage is directed against the jet so as to impinge upon it. The stream of gas and air partially mixed passes through a throat beyond which the passage first expands and afterwards contracts, or successive expansions and contractions may be provided. The mixed stream issuing from this passage may undergo combustion in the open air, like the stream issuing from the tube of an ordinary Bunsen burner; but for many purposes it is preferred to cause the stream to enter another conical passage, similar to that previously mentioned, where a further quantity of air is caused to join it and impinge upon it, and the mixed stream passes through a throat into a chamber of refractory material, in which the mixture undergoes combustion. In order to mix thoroughly the air and gas, this second chamber may also vary in area alternately enlarging and contracting. The products of combustion issuing from it are used for any heating purpose required, as for instance to heat a boiler.

In order to be able to regulate at pleasure the quanties of air admitted at both places of admission, each of the conical passages is connected with a separate chamber communicating with the atmosphere by means of a passage furnished with a stop-cock, valve, or slide. More chambers might be employed if desired, the air being admitted in more than two places; but generally the two chambers, as above described, are sufficient.

To enable this apparatus to be employed for the different purposes for which it is applicable, various modifications are specified.

1117.—Körting, E., Hanover, "*Improvements in the mode of and apparatus for forcing and raising liquids, and for other useful purposes.*" Patent dated March 15, 1876.

The object of this invention is the construction of steam-jet apparatus, for forcing liquids, to work in a more economical and reliable manner than heretofore, and to render their application more fit for some purposes in practice. For this purpose two or more steam nozzles of different or graduated diameters or sectional areas are employed instead of one only, all of which are fitted centrally one into the other, the inner one always projecting some distance beyond the nozzle into which it is fitted. The liquid to be forced meets the steam in the usual condensing nozzle or chamber, into which it may flow either through one annular space centrally surrounding the steam nozzle, or through several consecutive annular spaces or slits, or through a number of openings in the condensing nozzle. Through the steam not meeting the liquid in only one place, but working on it in as many places as steam nozzles are provided for, the whirling and collapsing of the liquid at the place of condensation of the steam, which is very prejudicial to a good and reliable effect if the condensation of the whole mass of steam takes place at once, is to a great extent avoided.

1123.—Clark, A. M., Chancery Lane, London, "*Improvements in screw wrenches.*" A communication. Patent dated March 15, 1876.

This invention relates to certain improvements in screw wrenches, whereby

the moveable jaw may be quickly and readily adjusted to different sized nuts or bolt-heads with a very slight application of power, and it consists in a moveable jaw formed without a female screw thread, and sliding freely on the operating screw. It is provided with a spring of just sufficient stiffness to hold it in position when no resistance is brought to bear upon it, combined with an independent nut or carriage travelling upon the screw, and bearing against the moveable jaw for the purpose of holding it in position when pressure is brought to bear upon it, this carriage being in lieu of the female thread in the moveable jaw.

The invention also consists in a bar having an angular back and a concave front edge, and a moveable jaw having a tubular portion adapted to the concave front edge of the bar, and an angular keeper adapted to the angular back edge of the bar, whereby the jaw is provided with a firm and steady bearing on the bar.

1128.—Lowne, R. M., Finchley, Middlesex, "*Improvements in anemometers or instruments for measuring the velocity of currents of air or gas.*" Provisional protection only obtained. Dated March 16, 1876.

In this invention the blades of the fan are made of vulcanite instead of metal or mica, and the gearing communicating with the counting apparatus is arranged so that it shall be practically sealed off or protected from the entrance of dust, gases, and impure air. For this purpose instead of mounting a worm or screw on the axis of the fan of larger diameter than such axis, as heretofore, which necessitates the leaving of an open hole in the case of the counting apparatus, the worm or screw is formed as small as, or smaller than, the axis; or, preferably, the worm or screw is dispensed with, and in lieu thereof there is fixed on the axis of the fan a toothed wheel or a pinion, which communicates motion to the counting gear, thereby enabling the axis of the fan to be passed through a hole in the case of the counting gear closely fitting such axis.

1130.—Spour, W., Walker-upon-Tyne, "*Improvements in ratchet braces.*" Provisional protection only obtained. Dated March 16, 1876.

This invention consists chiefly in an arrangement of ratchet brace that will cause the ratchet tool to go twice the number of revolutions in a given time that the ordinary brace will drive it, and in a brace that will travel both during the forward and the backward stroke of the handle.

On the barrel or body of the ratchet brace, in which the main screw works at one end, and into which the tool is struck at the other end, there are two mitre wheels facing each other. The upper one of these (nearest the screw) is free to revolve, the other is fast. Gearing into these there is placed a preferably equal and similar mitre wheel made to run on an axis at right angles to the body of the brace. This axis consists of a bar, usually cylindrical in shape, and having an eye at one end encircling the body of the ratchet brace. The other end projects out so that it can rest against a stationary support, usually the drill stand, while a collar on the bar keeps the mitre wheel in position. The handle is also attached to the body by an eye or eyes, or usually one on each side of the eye of the stop-bar. On the handle are catches or pawls working on the ratchet mitre wheels, one in one direction, the other in the other. There can, if desired, be four pawls, two to each wheel, so arranged that only one can be in action at a time on each wheel. The operator can then arrange to make the tool turn either way. If desirable only one pawl, and that on the upper wheel, can be put in action. The ratchet brace will now be changed into a single-acting one, with this great advantage, however, that the drill goes through the double angular distance that the handle passes through in the same time, instead of through an equal distance, as in ordinary machines. When a hole is drilled, it can be tapped by putting the tap in the brace and driving it down by the brace screw. This brace has this advantage that by putting the back pawl or pawls into action instead of the ordinary one, the drill can be withdrawn by the brace.

1179.—Davies, P. J., King's Cross Road, London, "*Improvements in closet and other valves, and apparatus for cleansing, watering, controlling, regulating, and arresting the flow or discharge of water, and preventing waste thereof.*" Patent dated March 18, 1876.

This invention consists partially in certain arrangements and combinations of apparatus so contrived and adapted as to act as water-waste preventers for fixing in cisterns under water or otherwise, whereby simplicity, economy, and freedom from derangement are more effectually attained than heretofore. This is partially effected by employing one or more diaphragms of suitable material or materials (such as leather or india-rubber) to act with or without a plate, disc, cup, or other apparatus, which will form a sucker that may act either directly or indirectly; or with a valve which will also at times form a sucker for the purpose of actuating a valve or valves. This sucker can be applied to the top or other parts of a valve, either fixed in a cistern or to pipes or otherwise, and when pulled up with a screw, cam, lever, wire, rod, chain, or otherwise, will allow the valve to fall or go back to its seat after a given time, which may be regulated by a small tap, screw, or valve, so that it is impossible to keep the valve open beyond a certain length of time, thereby preventing waste.

Another part of the invention consists in a valve seating, which is also applicable to the "Hornsey" and other valves. Instead of having the main inlet water-way through the sides or parallel with the bottom of the cistern, the main inlet water-way is formed underneath or vertically with regard to the bottom of the cistern, which simplifies the valve seatings, and prevents the valve being propped open by any small pieces of solid substance that may be swimming in or on the water, or by persons tampering with the valve by placing anything between the valve and seating, thereby preventing wilful waste.

Another part of the invention relates to what is known as the "two gallon London closet-valve waste-preventing cistern," working with moveable and fixed valve seatings and syphons with service-box arrangements described in patent No. 1579, of 1873, and consists in forming the division or plate between the top and bottom of the cistern much lower, and supporting the same on a ledge. By making the hollow spindle work through this partition, the bottom box or lower division of the cistern to be supplied slowly (when the outlet valve is closed) with water through any of the hollow spindles and valve boxes described in the above patent. When the inlet-valve is shut and the outlet-valve opened, a syphon communication is established between the top and lower boxes. This can be easily accomplished by placing a tube closed at one end over the present air-pipe, but it is preferred to construct it in the angles of the cistern, or by forming the syphon of zinc, copper, lead, or other materials (easily soldered), and fixing the same over or into a socket cast to the middle partition. This will syphon or take the necessary portion of the water from the top or large division (which must be of certain dimensions on account of the room for the ball-valve working) to supply the lower, but only when the outlet-valve is full open, and only then for a given time, by reason of a small air-hole made in the syphon or top tube, so that the lower box or division need only be made proportionately large to set the syphon or syphons in action thereby. This part of the invention enables a starting compartment to be made in this small cistern, which, instead of being made to hold 1½ or 2 gallons, as heretofore, may be made less than one quarter that size, which will better answer the purpose. It is intended to continue the use of the present syphon when required for the purpose of converting this same cistern into an "after-flush" cistern; and the syphon is improved by forming a ventilating hole, which can be adjusted by a screw-tap or small valve near the top of the syphon.

The invention also relates to certain improvements in what are known as water-frugals (or water-waste preventers) for which letters patent were granted to the present inventor on July 3, 1871, No. 1716, and consists in making the locomotive clack and carrier therein described work within the retarding valve, and in some cases this valve or locomotive clack is made to work without the carrier.

APPLICATIONS FOR LETTERS PATENT.

635.—Clayton, L. and L., Hunslet, Leeds, "An improved mode of and apparatus for punching metal plates to be used as gasholder top sheets." Feb. 15, 1877.

640.—Haddan, H. J., Strand, Westminster, "Improvements in apparatus for cutting pipes, columns, shafts, and such like." A communication. Feb. 16, 1877.

641.—Rignall, R., Hull, "An improved adjusting pipe-tongs." Feb. 16, 1877.

642.—Walker, W., Scholes, York, "Improvements in rings for joints, for steam, water, gas, or air." Feb. 16, 1877.

657.—Green, C. H., Old Broad Street, London, "Improvements in the arrangement and construction of gas-stoves and utensils to be used therewith, and for other purposes." A communication. Feb. 17, 1877.

663.—Newman, J., and Duesbury, W., Derby, "Improvements in apparatus for transmitting gas from the retorts to the 'hydraulic main.'" (Complete specification.) Feb. 17, 1877.

687.—Russell, W. J., and Wilson, R., Croydon, Surrey, "Improvements in locks or fastenings for securing the lids to the bodies of gas syphon boxes and other similar cases or coverings." Feb. 20, 1877.

688.—Hunt, C., Birmingham, "Improvements in gas-meters." Feb. 20, 1877.

705.—Livesey, G. T., Old Kent Road, London, "Improvements in apparatus used in the purification of gas." Feb. 21, 1877.

706.—Jackson, W. M., Rhode Island, U.S.A., "Improvements in gas-stoves." (Complete specification.) Feb. 21, 1877.

726.—Johnson, S., Wood Green, and Burton, R., Clerkenwell, London, "Improvements in gas-meters." (Complete specification.) Feb. 22, 1877.

727.—Buchholz, J. A. A., Hammersmith, London, "Improvements in the manufacture of gas for lighting purposes, and in machinery or apparatus connected therewith." Feb. 22, 1877.

748.—Stove, A. S., Lerwick, Shetland, "Improvements in the manufacture of gas, and in the apparatus or means employed therefor." Feb. 23, 1877.

765.—Boulton, M. P. W., Tew Park, Oxford, "Improvements in apparatus for producing heat by the combustion of inflammable gases or vapours." Feb. 24, 1877.

766.—Boulton, M. P. W., Tew Park, Oxford, "Improvements in engines worked by products of combustion, either alone or in conjunction with other elastic fluid." Feb. 24, 1877.

770.—Smith, J., jun., and Dowker, W., Barrow-in-Furness, Lancs, "Improvements in apparatus for feeding fuel to furnaces, gas producers, and other combustion chambers." Feb. 24, 1877.

795.—Dennis, T. H. P., Chelmsford, Essex, "Certain improvements in water-waste preventers." Feb. 27, 1877.

796.—Milnes, J., Milnesbridge, York, "Improvements in taps for steam and water." Feb. 27, 1877.

819.—Hallewell, R., Blackburn, Lancs, "Improvements in gas motor engines and in the valves of such engines." Feb. 28, 1877.

824.—Turnbull, R., Glasgow, "Improvements in collecting and purifying sewage, and in the apparatus or means employed therefor." March 1, 1877.

PATENTS WHICH HAVE PASSED THE GREAT SEAL.

3319.—Duckett, J. D., Rotherham, York, "An improved cistern and self-acting water-waste preventer (superseding the ball-float)." Aug. 24, 1876.

3365.—Frost, J., Huddersfield, York, "Improvements in purifying sewage and foul water, and in treating water for boiler purposes." Aug. 26, 1876.

3443.—Morgan-Brown, W., Southampton Buildings, London, "A new or an improved hydro-piro-pneumatic pump." A communication. Sept. 1, 1876.

3485.—Clark, A. M., Chancery Lane, London, "Improvements in the purification of gas." A communication. Sept. 4, 1876.

3493.—Gidney, J. W., West Ham, Essex, "Improvements in apparatus for carburetting air or gas for illuminating or heating purposes." Sept. 5, 1876.

3528.—Robinson, C. S., Leicester, "Improvements in burners for burning a mixture of gas and atmospheric air." Sept. 8, 1876.

3547.—Webber, C. E., Knightsbridge, London, "Improvements in the manufacture and mode of utilizing gas for heating or other purposes, and in the apparatus or means employed therein." Sept. 9, 1876.

3551.—Johnson, J. H., Lincoln's Inn Fields, London, "Improvements in the treatment of the iron residues obtained in the purification of coal gas, and in the obtaining of products therefrom." A communication Sept. 9, 1876.

3571.—Johnson, J. H., Lincoln's Inn Fields, London, "Improvements in closets or receptacles for sewage matters, and in the means of or apparatus for disinfecting or deodorizing such matters." A communication. Sept. 12, 1876.

3756.—Wirth, F., Frankfort-on-the-Maine, Germany, "An improved method of treating spent materials from the gas-works by recovery of sulphur." A communication. Sept. 26, 1876.

PATENTS WHICH HAVE BECOME VOID

BY REASON OF THE NON-PAYMENT OF THE ADDITIONAL STAMP DUTY OF £50 BEFORE THE EXPIRATION OF THE THIRD YEAR.

467.—Caffall, R. M., and Thomas, A., "Improved means of and appliances for effecting the automatic sealing of hydraulic gas-mains, and for removing the pressure of gas on retorts at pleasure." Feb. 5, 1874.

499.—Underhay, F. G., "Improvements in bib-cocks or cocks for drawing off water." Feb. 7, 1874.

531.—Johnston, W., "Improvements in machinery or apparatus for compressing air or gases." Feb. 11, 1874.

565.—Hazeldine, F., "An improved valve or tap for liquids and other purposes." Feb. 14, 1874.

566.—Box, W. W., "Improvements in apparatus used in the manufacture of gas." Feb. 14, 1874.

567.—Richards, W., "Improvements in regulating the supply of fluids and liquids for the manufacture of illuminating gas, and for the apparatus employed therein." Feb. 14, 1874.

601.—M'Beath, C., "Improvements in retorts and apparatus connected therewith for the purpose of distillation and calcination of minerals, parts of which are applicable to other purposes." Feb. 18, 1874.

641.—Holland, H., "Improvements in the manufacture of gas for illuminating and heating purposes." Feb. 19, 1874.

The GRAND MEDAL of MERIT at the VIENNA EXHIBITION, and TWO MEDALS at the PHILADELPHIA EXHIBITION, have been AWARDED to GWYNNE & CO. for GAS-EXHAUSTERS, ENGINES, and PUMPS;
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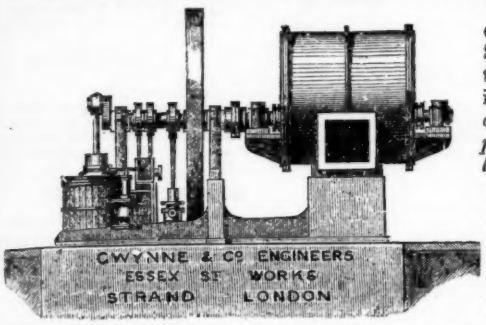
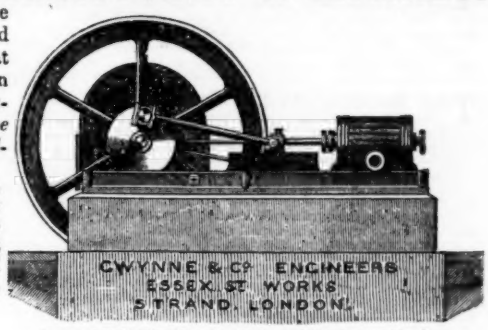


EXHAUSTER with Trunk Engine, capable of passing 210,000 cubic feet per hour.

The Judges report on the combined Exhauster and Steam-Engine exhibited at the Philadelphia Exhibition is—"*Reliable compact Machine, well adapted for the purpose intended, of excellent workmanship.*"

GWYNNE & CO. have made the largest and most perfect Gas-Exhausting Machinery in the world, and have completed Exhausters to the extent of 7,000,000 cubic feet passed per hour, of all sizes from 2000 to 210,000 cubic feet per hour.



52,500 EXHAUSTER, with Horizontal Engine combined.

GWYNNE & CO. do not pretend to enter into a struggle with other makers in respect to cheapness. They have never sought to make price the chief consideration, *but to produce machinery of the very highest quality, and most approved design and workmanship.* The result is that in every instance their work is giving the fullest satisfaction. Numerous testimonials and references can be given to Companies using their Machinery for years past.

Exhausters, with or without Engines combined, can be made to pass the gas without oscillation or variation in pressure.
Regulators, Bye-Passes, Stop-Valves, Gas-Valves, Station Governors, and Gas Machinery of all Sizes.

PLEASE ADDRESS IN FULL, GWYNNE & CO., Hydraulic and Gas Engineers,
ESSEX STREET WORKS, VICTORIA EMBANKMENT, LONDON, W.C., ENGLAND.

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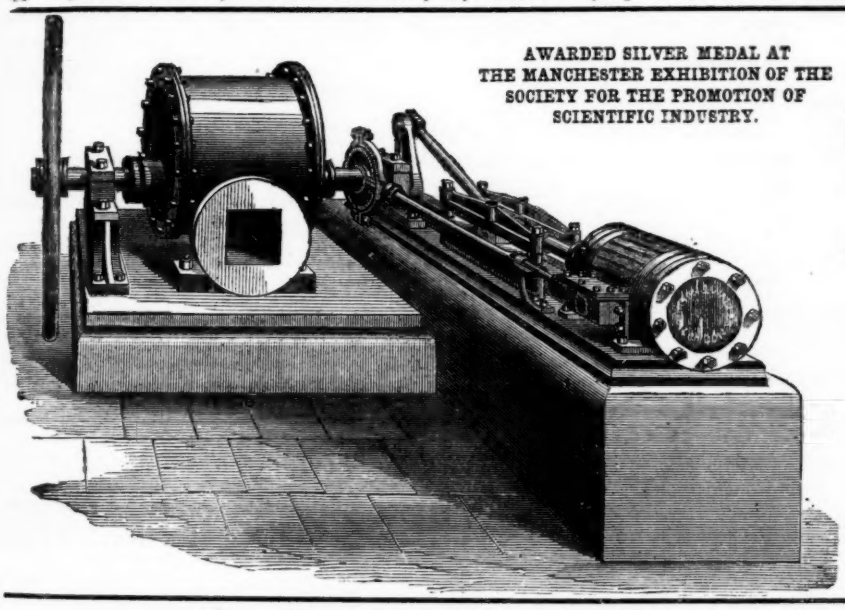

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GAS-EXHAUSTERS
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ENGINES COMBINED.
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ENGINES, EXHAUSTERS,
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HYDRAULIC MAIN VALVES,
BYE-PASS VALVES,
TAR, LIQUOR, and other PUMPS,
SCRUBBERS and PURIFIERS,
CONDENSERS, BOILERS, &c.

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STROUD, GLOUCESTERSHIRE.

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ENGINEERS,
FOUNTAINBRIDGE WORKS, EDINBURGH,
MANUFACTURERS OF **WET AND DRY GAS-METERS;**
Patentees and Sole Manufacturers of "PEEBLES' GAS-GOVERNORS,"
FOR STATIONS, DISTRICTS, DWELLING-HOUSES, AND PUBLIC LAMPS,
OF WHICH UPWARDS OF 90,000 ARE NOW IN SUCCESSFUL USE.
"These Lamp-Governors are so superior that they are likely to supplant all others."—*Dr. Wm. Wallace, F.R.S.E., F.C.S.*

METER REPAIRER.

WANTED, at the Reading Gas-Works, a steady and experienced METER REPAIRER. Used to both Wet and Dry Meters. The situation is a permanent one.
Apply, stating age, experience, and wages required, to Mr. E. BAKER, Engineer.

WANTED, a Gasman competent to undertake the complete Manufacture and Distribution of Gas, at works having four beds of retort, and to lay and repair mains, service-pipes, &c. Wages £1 10s. per week, with assistance; dwelling-house, coals, and lights found.
Apply on or before the 17th of March, by letter, enclosing copies of testimonials, addressed to the Secretary, Ilford Gaslight and Coke Company, Ilford, ESSEX.
Only those who are written to need attend.

HAMPTON COURT GAS COMPANY.

TO BE SOLD cheap, as they stand, Four Cast-Iron PURIFIERS, 8 feet square, with wrought-iron covers, wood sieves, columns, girders, and lifting apparatus complete; and 8-inch Hydraulic Centre Valve and connexions, all in good condition.
Apply to Mr. E. PRICE, Engineer, Gas-Works, HAMPTON WICK.

THE late Storekeeper and Clerk, and Pay Clerk to the Commercial Gas Company, for the last five years, is desirous of meeting with a similar SITUATION, or as Commercial Traveller, or London Agent for one or more good firms. The Advertiser is thoroughly competent to take the responsibility of buying, and the entire control of the stores, and would desire a salary which would render anything but the interest of his employers out of consideration.
Address Mr. CHARLES F. RESTELL, 33, Bloomfield Road, Burdett Road, Bow, E.

FOR SALE.

A Set of 8-in. Vertical Condensers, with Tar-Box and all connexions complete, containing about 180 ft. of pipes.
May be seen and price obtained on application to H. and F. BAILEY, Engineers, EAST RETFORD.

READING GAS COMPANY.

FOR SALE, as they now stand, and at any reasonable price, as the ground upon which they stand is wanted, four 12-ft. square Cast-Iron PURIFIERS, with centre-valve and connexions, grids, tee bars, &c., complete.
Apply to Mr. E. BAKER, Engineer, Gas-Works, READING.

TO GAS COMPANIES, CORPORATIONS, &c.

THE Advertiser, who has had great experience in the general management of large gas undertakings, and is thoroughly acquainted with the construction and working of all apparatus connected with the manufacture, analysis, and distribution of gas, wishes for a permanent APPOINTMENT.
Reference is kindly permitted to R. P. Spice, Esq., C.E., 21, Parliament Street, WESTMINSTER, S.W.
Address No. 351, care of Mr. King, 11, Bolt Court, Fleet Street, E.C.

FOR SALE, a Set of 6-in. Vertical CONDENSERS, with tar-box and all connexions complete.
May be seen, and price obtained, on application to the Southbank and Normanby Gaslight and Coke Company, Limited, Southbank, YORKSHIRE.

W. HAILES, Furnace Builder and Retort Setter, contracts for the Setting of RETORTS, in large or small works, at home or abroad. Sixteen years with the Commercial Company, London; Setter for the Isle of Thanet, Deal, Dartford, Brentford, and Wandsworth Companies, &c. The best Stourbridge goods supplied if required.
Address, 3, High Street, Brentford, MIDDLESEX.

FOR SALE, a Second-hand Gasholder, 33 ft. diameter and 9 ft. deep. Is in very good condition, and will be sold cheap.

Apply to Mr. W. T. Hews, Gas-Works, Henley-on-Thames.

TO BE SOLD, Four Cast-Iron Purifiers, 6 ft. square, with hydraulic centre-valve; also Ten 18-in. round, and Sixty-two 15-in. round Retort Mouthpieces, and Forty-seven 6-in. H-Pipes.

Apply to W. Winstanley, Manager, Gas-Works, Newcastle-under-Lyme.

THE Swansea Gaslight Company have for immediate SALE, the following Plant:—

A 6-hp. Patent Trunk Engine. (Beale.)
Exhauster to pass 15,000 feet per hour. (Beale.)
An 8-h.p. Grasshopper Engine. (Easton and Amos.)
Exhauster, 20,000 ft. per hour. (Beale.)
Tar, Liquor, and Water Pumps, Eccentrics, Shafting, and Driving Pulleys.
Wrought-iron Condenser, six vertical Legs, 30 ft. high, 24 in. by 6 in., with tar-boxes, dips, and syphons.
A set of four cast-iron Purifiers, 12 ft. square by 5 ft. deep, with galvanized wrought-iron covers, lifting apparatus, four tiers of wooden sieves, 10-in. connexions and valves.

May be seen at the Gas-Works, Swansea. The whole in perfect working order; replaced by plant of larger dimensions.

Further particulars may be obtained on application to Mr. Thornton Andrews, Swansea.

THE Sheffield United Gaslight Company are desirous of receiving TENDERS for the building of the whole or a portion of forty-nine settings of through and through RETORTS.

The clay retorts, bricks, fire-clay, and all material will be provided by the Company, the contractor to find all labour necessary for the erection of the settings complete.

Plans and specifications of the work may be seen on application at the Offices of the Company.

Tenders per bed of seven retorts to be sent in not later than the 21st inst., addressed to the undersigned.

The Directors do not bind themselves to accept the lowest or any tender.

Thos. Roberts, Manager.

Gas Offices, Commercial Street, March 1, 1877.

TO TAR DISTILLERS.

THE Directors of the Harrogate Gas Company solicit TENDERS for the SURPLUS TAR produced at their works (about 150 tons by weight per annum) for One, Two, or Three years, from the 15th day of April next, the Contractor to find his own casks, and to remove the Tar as required by the Company, who will fill the casks and deliver them into the Contractor's trucks at Starbeck Station.

Tenders, stating duration of contract, to be addressed undersigned not later than the 21st inst.

By order,
P. H. Wilkinson, Secretary.

TO GASHOLDER MAKERS.

THE Directors of the Market Har- borough Gas Company are prepared to receive TENDERS for a Single-Lift GASHOLDER, 60 ft. in diameter and 18 ft. deep.

Plans and specifications may be seen at the Works of the Company, at Market Harborough, or on application to Mr. John Eunson, C.E., Northampton.

Tenders addressed to the Secretary, endorsed "Tender for Gasholder," to be delivered on or before the 31st of March. By order,

John Lester, Secretary.

Market Harborough, March 2, 1877.

TO BUILDERS AND CONTRACTORS.

THE Directors of the Market Har- borough Gas Company are prepared to receive TENDERS for a GASHOLDER-TANK, 62 ft. in diameter and 18 ft. deep, to be constructed at the Gas-Works, Market Harborough.

Plans and specifications may be seen at the Works of the Company, or on application to Mr. John Eunson, C.E., Northampton.

Tenders addressed to the Secretary, endorsed "Tender for Gasholder-Tank," to be delivered on or before Saturday, March 24. By order,

John Lester, Secretary.

Market Harborough, March 2, 1877.

BOROUGH OF HALIFAX.

TO IRONFOUNDERS.

THE Gas-Works Committee of the Cor- poration are prepared to receive TENDERS for the supplying and fixing at the Halifax Gas-Works of Three Cast-Iron GAS-PURIFIERS.

Specifications may be seen and forms of tender obtained on application to Mr. Wm. Carr, Engineer, Gas-Works, Halifax, and tenders, properly endorsed, must be sent to me on or before Thursday, the 21st day of March, 1877.

By order,
A. C. Foster, Town-Clerk.

Town-Hall, Halifax, Feb. 23, 1877.

TO TAR DISTILLERS, MANUFACTURERS, AND OTHERS.

THE Directors of the Phœnix Gaslight and Coke Company are prepared to receive TENDERS for the purchase of the TAR made at their respective stations at Vauxhall, Bankside, and Greenwich, for the period of One, Two, or Three years from the 1st of April next. The quantities will be, approximately—Vauxhall, 1,000,000 gallons; Bankside, 280,000 gallons; and Greenwich, 360,000 gallons, in twelve months; total, 1,640,000 gallons.

Tenders may be made for one or more of the stations.

Forms of tender and conditions of contract may be had upon application to the Secretary, 70, Bankside.

Tenders, endorsed "Tender for Tar," to be delivered at this Office on or before Wednesday, March 21, at One o'clock p.m.

The Board do not bind themselves to accept the highest or any tender.

By order of the Court of Directors,
I. A. Crookenden, Secretary.

70, Bankside, London, S.E., March 7, 1877.

COMMERCIAL GAS COMPANY.

NOTICE is hereby given that the next ORDINARY MEETING of the Commercial Gas Company will be holden at the Cannon Street Hotel, in the City of London, on FRIDAY, the 6th of April, 1877, at Twelve o'clock at noon, to receive the Report of the Directors, to declare a Dividend, to elect Auditors, and for other business.

The Books will be closed for the transfer of Stock from the 23rd of March inst. to the 6th of April next.

By order of the Board,
E. J. Southwell, Secretary.

Offices, Stepney, March 9, 1877.

PHŒNIX GASLIGHT AND COKE COMPANY.

NOTICE is hereby given that the ADJOURNED HALF-YEARLY GENERAL MEETING of PROPRIETORS holding, previous to the 31st of December last, £300 paid-up capital and upwards in the said Company, will be held, pursuant to the Act of Incorporation, on WEDNESDAY, the 4th of April, at Two o'clock precisely, at the Bridge House Hotel, in the Borough of Southwark, for the purpose of declaring Dividends to the 31st of December last, to elect Directors and Auditors for the ensuing year, and on other business.

The Transfer Books will be closed on and after the 14th of March, and reopened on the 5th of April.

By order of the Court of Directors,
Isaac Adolphus Crookenden, Secretary.

70, Bankside, London, S.E., March 1, 1877.

CRYSTAL PALACE DISTRICT GAS COMPANY.

NOTICE is hereby given that the ORDINARY HALF-YEARLY GENERAL MEETING of this Company will be held at the Albion Tavern, Aldersgate Street, on THURSDAY, the 29th day of March, 1877, to receive the Report of the Directors, the Balance-Sheet confirmed by the Auditors, to declare a Dividend, and for general purposes.

The Chair will be taken at half-past Two o'clock precisely. By order of the Board,

Magnus Ohren, Secretary.

Offices and Works, Lower Sydenham, S.E.

NAPHTHA.

THE Undersigned are prepared to give the highest market value for genuine crude COAL TAR NAPHTHA.

Address Hamilton Macbean & Co., Blackhorse Bridge, Deptford, London.

EXHIBITION OF APPARATUS FOR COOKING AND HEATING BY GAS, OF GAS BATHS, GAS ENGINES, &c.

THE Directors of the South Shields Gas Company purpose to hold a PUBLIC and FREE EXHIBITION of the above nature in the FREE LIBRARY HALL, SOUTH SHIELDS, on the 9th, 10th, and 11th of April, 1877, when Seven Silver Medals will be awarded for the best Apparatus exhibited.

The following gentlemen have consented to act as Judges:—

John Pattinson, Esq., Analytical Chemist, Newcastle-upon-Tyne; W. H. Bennett, Esq., Civil Engineer, Secretary of the British Association of Gas Managers; to be assisted in testing Cooking Apparatus by a Professional Cook.

The co-operation of Manufacturers and others is invited.

An early application for prospectus and space is requested, and to be made to the Company's Engineer,

W. J. Warner.

Gas-Works, South Shields, March 8, 1877.

THE BRITISH GASLIGHT COMPANY, LIMITED.

NOTICE is hereby given that the HALF-YEARLY GENERAL MEETING of the PROPRIETORS of this Company will be held at this Office, on WEDNESDAY, the 28th inst., at One o'clock precisely, to transact the usual business, to declare the Dividend for the half year ending the 31st of December last, and to elect a Director in the place of Alfred Edenborough, Esq., deceased.

Notice is hereby also given that the Transfer Books of the Company will be closed on the 16th, and re-opened on the 29th inst.

By order of the Court of Directors,
Frederic Lane Linging, Secretary.

Office, No. 11, George Yard,
Lombard Street, E.C., March 7, 1877.

N.B.—Any qualified proprietor intending to become a candidate for the vacant seat at the Board is required to signify the same by a written notice under his hand, to be left at the Office of the Company twelve days at least previous to the 27th inst.

MELTON MOWBRAY GAS-WORKS.

TO BUILDERS, CONTRACTORS, AND OTHERS.

THE Directors of the Melton Mowbray Gaslight and Coke Company are prepared to receive TENDERS for the excavation and building of a Brick GASHOLDER-TANK, 83 ft. diameter and 22 ft. deep.

Drawings and specifications may be seen on application at the Works of the Company.

Sealed tenders to be forwarded on or before Ten o'clock on the 24th day of March inst., addressed to Mr. Joseph Miles, Clerk, Gas Office, High Street, Melton Mowbray.

The Company do not bind themselves to accept the lowest or any tender.

OVER DARWEN LOCAL BOARD OF HEALTH.

GAS AND WATER DEPARTMENT.

THE Gas Committee are prepared to receive TENDERS for the supply of the following Cast-Iron PIPES, with bends, tees, branches, syphons, &c.

750 yards 18-inch Cast-Iron Pipes.
600 „ 12 „ „
500 „ 8 „ „

Also the necessary 18-inch flange-pipes, bends, syphons for gasholder, connexions, inlet and outlet.

Sealed tenders, endorsed "Tender for Street-Mains, &c." must be sent in not later than One o'clock on Thursday next, March 15, 1877, addressed to the undersigned, from whom specifications and further particulars may be obtained.

The lowest tender not necessarily accepted.

John Marsland, Engineer and Manager.

Gas-Works, Darwen, May 9, 1877.

BIRSTALL LOCAL BOARD.

TO GAS-WORKS MANAGERS.

THE Birstall Local Board (who make about 15 millions of gas annually) require the services of a Gas-Works MANAGER, who will be allowed to occupy the residence on the works free of rent, rates, and taxes, and will be supplied with coals, gas, and water free of charge.

The person to be appointed will have to enter on his duties on April 2, 1877.

Applications, stating salary required, accompanied by testimonials of recent date, to be sent to me, endorsed "Gas-Works Manager," not later than Five o'clock in the afternoon of Monday, the 19th inst.

No canvassing will be allowed. Any candidate canvassing will be disqualified.

Address John Smith, Solicitor, Birstall, near Leeds.

March 7, 1877.

Now ready, price One Shilling, No. 4 (to be continued Monthly) of

A TREATISE ON THE SCIENCE & PRACTICE

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COAL GAS.

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Meter Works in London—2, CROSS STREET, WILDERNESS ROW, E.C.

STATION-METERS, GOVERNORS, CONSUMERS METERS, GAS LUSTRES, CHANDELIERS, BRACKETS, &c.,

And every description of Gas-Fittings and Gas Apparatus.

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JOHN HALL AND CO., STOURBRIDGE,

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45, OXFORD STREET, LONDON, W.

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WALL LIGHTS, AND LUSTRES FOR GAS AND CANDLES.

TABLE GLASS OF ALL KINDS.

CHANDELIERS IN BRONZE AND ORMOLU. MODERATOR LAMPS.

Now Publishing, will be ready the first week in April,

THE GAS & WATER COMPANIES DIRECTORY

FOR THE YEAR 1877,

EDITED BY

CHARLES W. HASTINGS,

8, BUCKINGHAM STREET, ADELPHI, LONDON, W.C.,

CONTAINS

An Alphabetical List of Towns in England having Gas or Water Companies.
Date of Formation of the Company.
If Incorporated under Special Act of Parliament, and the date of such Act or Acts.
If under any of the Limited Liability Acts.
Amount of Share Capital.
Name of Chairman.
Name of Engineer or Manager.
Name of Secretary.
If Let on Lease, Name of Lessee.
If a Private Venture, Name of Owner.
If Purchased by the Corporation (and in cases where possible the date of such Purchase), or if the Property of the Local Authorities.
Population of all Towns.
Railway Communication, and the Distance from London.
Special Notice is taken of all the Members of the "British Association of Gas Managers."

THIS WORK IS UNDER THE PATRONAGE OF ALL THE LEADING GAS & WATER ENGINEERS AND SECRETARIES OF THE METROPOLITAN & PROVINCIAL COMPANIES.

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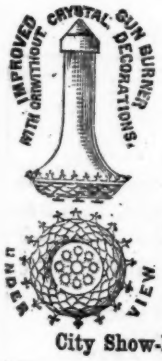

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In Silver and Glass

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AND
BURNERS
Of every description.

Pattern-Books of Gas-Fittings, Crystal and Ormolu Chandeliers for 1876, are now complete.

City Show-Rooms and Manufactory, 147, HOUNDSDITCH, LONDON.

ESTABLISHED 1830.

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COOKING AND HEATING.

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For GAS COMPANIES to distribute to their Gas Consumers.

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FORMS OF ANNUAL ACCOUNTS, arranged as required by the 35th Section of the Act (34 & 35 Vict., cap. 41), are now ready.

These Forms have been printed on large sheets of paper of the best quality, and are carefully ruled so as to afford the utmost facility for compliance with the provisions of the Act.

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HENRY LYON,

ENGINEER,

AND

CONSULTING GAS ENGINEER,

BROOKLYN, CHEETHAM HILL ROAD,

MANCHESTER.

TO INVENTORS AND PATENTEES.

MR. W. H. BENNETT, having had considerable experience in matters connected with Gas, Water, and Sanitary Improvement, begs to say that he continues to assist Inventors in the perfection of their designs, and to obtain for them PROVISIONAL PROTECTION, whereby their invention may be secured for Six Months; or LETTERS PATENT, which are granted for Fourteen Years.

Patents completed, or proceeded with at any stage, thereby rendering it unnecessary for persons resident in the country to visit London.

Patents procured for Foreign Countries.

Information as to cost, &c., supplied gratuitously upon application to the Advertiser, 22, Great George Street, WESTMINSTER.

THE Vale of Neath Dinas Fire-Brick and Cement Company, Limited, Pontwalby Works, Glyn Neath, South Wales.

Manufacturers of the Celebrated DINAS FIRE-BRICKS and CEMENT, as supplied to The Gaslight and Coke Company, Beckton, the Imperial Continental Gas Association, &c., &c. Prices and estimates on application.

LONDON AGENCY, 11, Queen Victoria Street, CITY.

PATENT FUEL AND LIME FOR PURIFYING FROM FOUL LIME.

By a simple process the Foul Lime is converted into Fuel, by the combustion of which the lime is reproduced as a purifying agent.

Licences to work the invention will be granted to Gas Companies on very reasonable terms.

For further particulars apply to Mr. E. MADDOCKS, Manager of the Gas-Works, KETTERING.

The adoption of the above invention, without a licence from the Patentee, will be an infringement of the patent, and will subject the person or company guilty of such infringement to legal process.

NOTICE OF REMOVAL.

CLAYTON, SON, and CO. beg to call the attention of their friends to the fact that they have REMOVED from their Old Works in Belinda Street, Church Street, Hunslet, to their new place of business, PROVIDENCE IRON-WORKS, near the Railway Station, Moor End, Hunslet, Leeds.

Their New Works are much more commodious. In them they have put down improved machinery for the manufacture of Gasholders, Boilers, Roofs, &c.

C. S. & Co. take this opportunity of thanking their friends and the public for past favours, and trust they may be supported in the future. All orders entrusted to their care shall have their usual prompt and careful attention, and will be executed in the best workmanlike manner, as in the past.

ESTABLISHED IN 1860.

BENJAMIN CARPENTER,

THE ORIGINAL MANUFACTURER OF THE IMPROVED

WOOD SIEVES

FOR

GAS PURIFIERS & SCRUBBERS.

PROVIDENCE WORKS,

22, HERMES STREET, PENTONVILLE ROAD,

LONDON, N.

YEO'S PATENT ENGINE PACKING.

By Her Majesty's Royal Letters Patent.

EPHRAIM YEO, Inventor, Patentee, and SOLE MANUFACTURER of the Patent Excelsior Self-Lubricating Rope Engine Packing; also Manufacturer of Improved Tarred and White Spun Yarn for Gas and Water Pipe Joints, Coke Sacks, Fall Ropes, &c.,

NEWTON ABBOT, DEVONSHIRE.

Samples and particulars forwarded on application.

T. NEWBIGGING,

CONSULTING GAS ENGINEER,

5, NORFOLK STREET, MANCHESTER.

ALFRED LASS,

SPECIAL ACCOUNTANT FOR GAS COMPANIES,

30, GRACECHURCH STREET, LONDON.

Accounts analyzed and Statistics Prepared for Parliamentary Proceedings, Arbitrations, &c.

The Forms of Account, which have been specially designed by A. L. to meet the requirements of the Gas-Works Clauses Amendment Act, 1871, are now in use by many Gas Companies, and have been universally approved. The above forms are registered.

Water Companies Accounts also prepared and adjusted.

CONSULTATIONS.

JOHN ROMANS, C.E., F.G.S.E.,

CONSULTING GAS ENGINEER

AND

CANNEL COAL FACTOR,

30, St. Andrew Square, EDINBURGH.

Plans and Estimates furnished; Gas-Works, Apparatus, Pipes, Machinery, Fire Goods, &c., supplied, or Attested and Shipped for Exportation.

GAS-WORKS TAKEN ON LEASE.

Mr. Romans has for upwards of 30 years been practically engaged in the Manufacture of Gas, and has, by extensive experiments, ascertained that by JUDICIOUS INTERMIXTURE of the lighter with the heavier gases, much of the rich Hydrocarbons CAN BE SAVED, which otherwise ARE LOST, during the process of manufacture. He is therefore enabled to give advice to those who favour him with their orders for Cannel, as to the class which will secure for their standard of illuminating power the HIGHEST ADVANTAGEOUS RESULTS.

Analysis and Prices forwarded on Application.

BAILEY'S Patented Inventions are now in extensive use wherever steam is known. Bailey's Patent Steam Gauges, Pyrometers, Water Gauge Cocks, Test Pumps, Fusible Plugs, Steam and Water Valves, Safety Valves, Junction Valves, Pumps, Tell-Tales, Recorders, Lightning Conductors, Electric Telegraphs, Turret Clocks, Steam Joint Cement, Lifting Jacks, Boiler Feeders, Lime Catcher and Separator, Injectors and Ejectors, and every description of first-class Brass Work for Engines and Boilers. Gas-Works Managers who have not our large book should send for it.

16th edition, 1000 engravings, 4to., post free 3s. 6d. in stamps. weight 10 oz., cost of production £1000,

BAILEY'S Illustrated Inventions, containing details and prices of goods in our five several departments:—(1) Brass Foundry, Steam Gauges, Indicators, Feeders, and Fittings; (2) Engineers Sundries, Small Tools, and Stores; (3) Machine Pump and Fire Engine; (4) Turret Clock, &c.; (5) Electric Telegraph, A B C Instruments, Bells, and Apparatus.

W. H. Bailey and Co., Albion Works, Salford, Lancashire.

HEBBURN MAIN GAS COALS.

T. Stone, Esq., of Weymouth, writes on Nov. 17, 1876: "I have used about 12,000 tons of this Coal, with, I think, the best possible results, although not always under the most favourable circumstances. My Coal account made up to Midsummer last showed a makeage of 10,524 cubic feet per ton of 14½-candle gas, and not a hundredweight of Cannel used. This statement would, I know, be incredible to many men, and may provoke the remark, 'How much of it is paid for?' For the gratification of such, I have to say that, of the above quantity, 9866 cubic feet per ton of Coal carbonized were brought to charge and duly paid for, with the exception of about 6s. per cent. for bad debts. The coke is of excellent quality. The above facts I hold to be a greater recommendation to your Coal than any words of mine could be."

THE TYNE COAL COMPANY, LIMITED, OWNERS.

W. Richardson, Fitter,

29, QUAYSIDE, NEWCASTLE-ON-TYNE.

THE DIAMOND
ROCK-BORING COMPANY,
LIMITED,

CONTRACTORS, ARTESIAN WELL BORERS AND SINKERS.

Gold Medal for Rock-Boring Machinery . . . . Exhibition, 1873.
Silver Medal for „ „ . . . . Falmouth, 1875.

This Company now undertake the Sinking of Artesian Wells. Their system rivals all others, both for efficiency and speed, and in addition produces "Solid Cores" from the Rocks bored through, thus giving invaluable evidence of the strata passed through as the work progresses.—*Vide Brewers Journal, Oct.*, 1876, *and other papers.*

OFFICES:

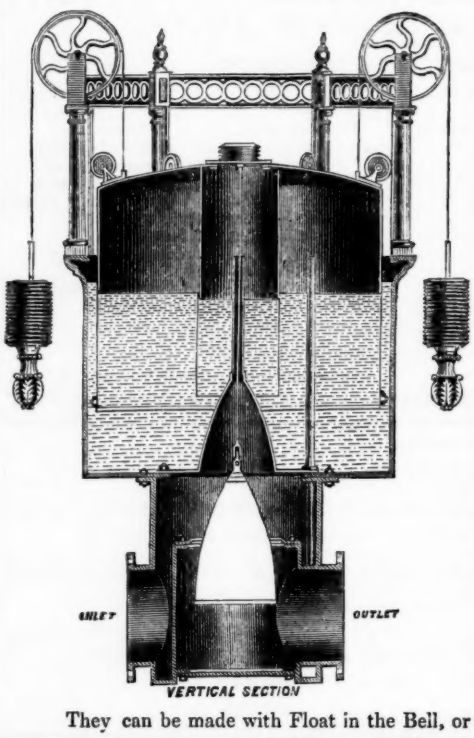
2, WESTMINSTER CHAMBERS, LONDON, S.W.

J. & J. BRADDOCK,
GLOBE METER-WORKS,
OLDHAM,

Beg to submit to Gas Engineers their

PATENT COMPENSATING GAS GOVERNOR,

Which is designed to give an uniform pressure at the Outlet to the Main at all draughts up to the full quantities which the Governors are made to control, such outlet pressure being less than the initial pressure.



VERTICAL SECTION

The uniformity of pressure is obtained by introducing a compensating chamber into the Bell or Holder of the Governor, which compensator is of the same area as the valve, both of which are operated on by the initial pressure, thereby placing the valve in equilibrium, no matter what the initial pressure may be. The action on the Bell is by the Gas passing along a pipe from the outlet, and the pressure is regulated by weights in connexion with the Bell as required.

From the sectional elevation attached hereto, it will be seen that only the Gas required to operate the Bell comes in contact with the water of the tank, which water will remain comparatively sweet and free from odour. That in case of accident to the Bell, no more Gas can escape than would pass up the pipe covering the valve-rod and Bell supply-pipe.

These Governors have been made and sent out of various sizes for from 2 to 24-inch Mains, and give most satisfactory results.

They can be made with Float in the Bell, or counterpoise as per section.

Size Strengths &c of Rolled Joists.										
A	B	C	D	E	A	B	C	D	E
41	19¾	7"	102	810	19	6"	5"	30	85
1	16"	5½	57½	400	17	6¾	5"	18	45
31½	15"	5"	50½	330	18	6¾	2"	10¾	30
3	14"	5½	60	325	20	5½	2"	10&12	22½
4	12"	6"	56	300	35	5½	7¾	12½	30
5	12"	5½	42	220	23	5"	4¾	23	35
30	10"	5"	36	175½	22	5"	3"	13	30
6	10"	4½	32	130	36	4¾	2"	6	17½
32	9½	4½	29	116	40	4"	3"	11	20
9	9½	3½	24&30	90	25	4"	2"	8½	14
33	9¾	2¾	18	60	37	3"	2"	5½	10
12	8"	4"	22	90	38	3"	3"	9	17½
11	8"	5"	29	95	A	No on Section Sheet			
13	8"	2½	15	40	B	Depth in Inches			
39	7"	4"	22½	70	C	Width of Flange			
15	7"	3½	19	60	D	Usual Weight Per Ft			
16	7"	2¾	14	35	E	Constant.			

TO FIND SAFE DISTRIBUTED LOAD IN TONS DIVIDE THE CONSTANT BY THE SPAN IN FEET.

ROLLED JOISTS & FLITCHES KEPT IN STOCK

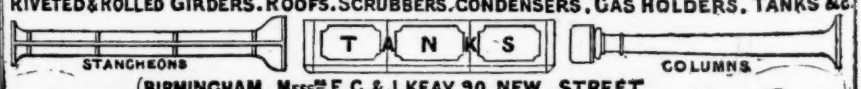
CHAS WILLIAMS, & Co.,

ENGINEERS AND IRON FOUNDERS.

90 CANNON STREET LONDON. E.C.

MANUFACTURERS OF CAST & WROUGHT IRONWORK OF EVERY DESCRIPTION

RIVETED & ROLLED GIRDERS. ROOFS. SCRUBBERS. CONDENSERS. GAS HOLDERS. TANKS &c.



AGENTS { BIRMINGHAM. Messrs E,C.& J, KEAY. 90, NEW STREET
GLASGOW Messrs BLACKLEY, YOUNG & Co 163, ST VINCENT STREET.
LIVERPOOL Mr W, E, HALLAM, ALBION BUILDINGS, CANNING PLACE }

SECTION SHEET, AND PARTICULARS ON APPLICATION TO THE ABOVE.

THE WIGAN COAL & IRON COMPANY,

LIMITED.

DISTRICT OFFICE: 97, NEW STREET, BIRMINGHAM; AGENT: W. M'GOWAN;

Supply the Best Wigan Arley Mine Gas Coal, Gas Nuts, Gas Cannel, &c.

N.B.—The Wigan Coal and Iron Company, Limited, are exclusive owners of the well-known HAIGH HALL AND KIRKLESS HALL GAS COAL COLLIERIES.

LIVESEY FIRE-CLAY WORKS.

NEAR BLACKBURN, LANCASHIRE.

(ESTABLISHED 1835.)

ORLANDO BROTHERS, LIMITED,

MANUFACTURERS OF PATENT CLAY RETORTS,

AND EVERY DESCRIPTION OF

TUBULAR GLAZED SEWERAGE PIPES, BENDS, JUNCTIONS, ETC.

FIRE-BRICKS, TILES, BLOCKS, AND CHIMNEY-TOPS

THE FARNLEY IRON COMPANY, LIMITED,

FARNLEY, near LEEDS,

MANUFACTURERS OF

FIRE-CLAY GAS-RETORTS & FIRE-BRICKS,

Of every size and shape, and of the best quality; also of White and Coloured GLAZED BRICKS, SANITARY PIPES, &c., &c.

In order to meet the constantly increasing demand for their Gas-Retorts, the F. I. Co. have recently made such an addition to their premises as will enable them to execute expeditiously the largest home or foreign orders.

London Agent for Gas-Retorts: D. W. OGG, 3, Jeffrey's Square, St. Mary's Axe, E.C.

" " Glazed Bricks: A. BARFIELD, 22, Great George Street, Westminster.

ROBT. DEMPSTER & SONS,

GAS ENGINEERS, IRONFOUNDERS, AND CONTRACTORS,

ROSE MOUNT IRON-WORKS, ELLAND, YORKSHIRE,

MANUFACTURERS OF EVERY DESCRIPTION OF

GAS APPARATUS;

CONTRACTORS FOR THE

ERECTION OF PUBLIC AND PRIVATE GAS-WORKS.

Plans and Specifications Prepared, and Illustrated Catalogues forwarded on application.

GAS PURIFICATION.

H. O. COOKE & CO.,

OXIDE MERCHANTS,

79, MARK LANE, LONDON, E.C.,

Are now supplying the best natural Oxide of Iron that has yet been brought into the market.

THE "RELIABLE" STEAM-PUMP

Is the only Pump that will Pump Tar and Thick Fluids successfully. Patentees and Sole Makers,

JOSEPH EVANS AND SONS,

HYDRAULIC AND GENERAL ENGINEERS, WOLVERHAMPTON.

THE "RELIABLE" PUMP

Has been adopted by the

BIRMINGHAM CORPORATION GAS-WORKS,

THE GAS-WORKS AT BLACKBURN,

LEEDS, CARLISLE, DUDLEY, WOLVERHAMPTON,

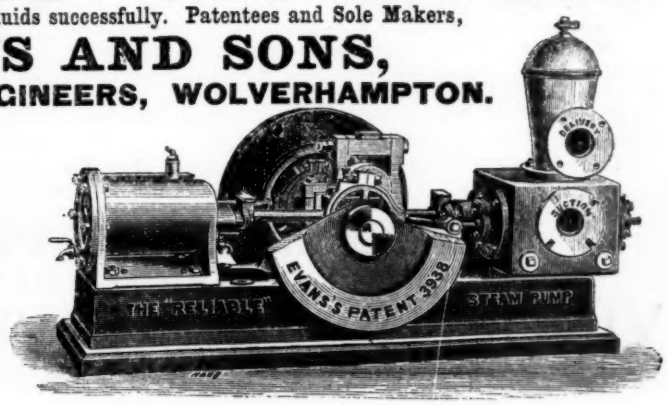
ETC., ETC.,

And also by the Principal

TAR DISTILLERS IN THE KINGDOM.

MAKERS AND PATENTEES OF PUMPS OF ALL KINDS.

CATALOGUES ON APPLICATION.



NOTICE TO GAS COMPANIES

UNDER THE GAS-WORKS CLAUSES ACT, 1871, &c.

THE "LONDON" STANDARD BURNER,

"GAS REFEREES MODEL,"

For 14-candle and 16-candle Gas, as certified by the Board of Trade.

Copies of this Standard Burner may now be had, engraved in accordance with the instructions of the Board of Trade, enclosed in Mahogany Box, with Glasses complete.

The "LONDON" ARGAND BURNER, with SELF-ACTING GOVERNOR (Patent).

"Westminster" Pattern Shade, as used in the Ministers Rooms and Lobbies of the Houses of Parliament. This Burner is No. D size, and, with a consumption of 5 cubic feet per hour, gives about 2 candles more light than the Gas Referees model, called the No. 1 "London" Argand Burner.

With 5 cubic feet per hour of gas, which gives a light equal to 14·3 parliamentary sperm candles (as tested by the Sugg-Letheby Standard Burner), the ordinary Argands give only a light equal to 10 sperm candles, while the No. F Patent "London" Argand Burner gives a light equal to 18½ sperm candles, or 85 per cent. more light for the same quantity of gas consumed.

The "CHRISTIANIA" FLAT-FLAME BURNER, with SELF-ACTING GOVERNOR (Patent).

This Burner has been pronounced by the most eminent Engineers of the day to be the perfection of a flat-flame Burner.

The Shades, which are made in a beautiful white glass called Albatrine, are manufactured *exclusively* for these Burners, and cannot be obtained elsewhere.

The light emitted from this Burner is very white and soft to the eyes, and is about 30 PER CENT. superior to the ordinary fishtail.

Numerous other pattern Shades, Plain or Ornamental, may be obtained with these Burners.

Price Lists and Prospectuses, with description of all the "London" Argand and other Burners, and their proper Shades, Supports, &c., forwarded post free on application.

WILLIAM SUGG,

GAS ENGINEER,

VINCENT WORKS, VINCENT STREET,

WESTMINSTER, S.W.

JOHN ABBOT AND CO.,

LIMITED,

IRON AND BRASS FOUNDERS,

PARK WORKS, GATESHEAD-ON-TYNE.

London Office: 2, SUFFOLK LANE, CANNON STREET.

Glasgow Office: 54, ST. ENOCH'S SQUARE.

MANUFACTURERS OF ALL DESCRIPTIONS OF

HYDRAULIC MACHINERY,

INCLUDING

ACCUMULATORS, FORCE-PUMPS, CRANES, & LIFTS,

FOR

GAS-WORKS, WAREHOUSES, &c.

IMPROVED HYDRAULIC MACHINERY,

Specially Arranged for Lifting and Lowering Purifier-Covers, &c.

MAKERS OF

PURIFIERS, CONDENSERS, SCRUBBERS, RETORTS;

PIPES FOR GAS AND WATER WORKS;

ROOFS, COLUMNS, AND GIRDERS.

DESIGNS AND ESTIMATES SUPPLIED ON APPLICATION.

THOMAS ALLAN & SONS,

IRONFOUNDERS,

WORKS:

SPRINGBANK FOUNDRY & NORTH WOODSIDE FOUNDRY,

GLASGOW;

BONLEA FOUNDRY, STOCKTON-ON-TEES,

Manufacturers of

CAST-IRON GAS AND WATER PIPES.

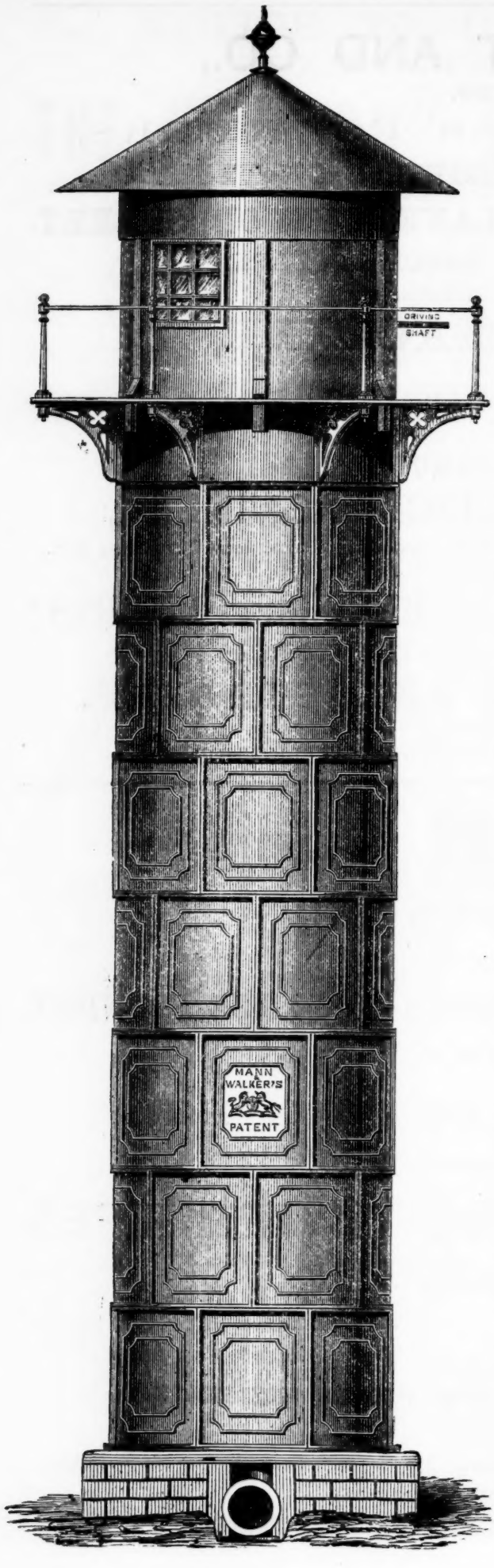
SIZES: ¾ to 12 inches at GLASGOW.

„ 1½ to 7 „ STOCKTON.

A LARGE STOCK KEPT, AND PRICES MODERATE.

Freight to London, in the Stream, 10s. per ton from Stockton; 12s. 6d. from Glasgow.

London Agent: Mr. A. C. FRASER, ST. STEPHEN'S CHAMBERS, TELEGRAPH STREET.



C. & W. WALKER,
8, Finsbury Circus,
London, E.C.

MANN & WALKERS' PATENT SCRUBBER.

By Letters Patent in Great Britain, Europe, and the United States of America.

By some important improvements recently patented, the purifying power of these Scrubbers has been much increased, and a stronger ammoniacal solution obtained, which is found to absorb a large portion of the carbonic acid contained in gas, effecting an important saving in money and labour in the lime purifiers, and where oxide only is used, the increase in the illuminating power of the gas obtained by these Scrubbers is shown in a remarkable degree, in consequence of the large quantity of carbonic acid removed from the gas.

It is to be particularly noted that the important results of these Scrubbers do not depend upon the machinery alone. The entire internal construction of the Scrubber bears an almost equally important part. For this reason, where it is desirable to convert existing Scrubbers, whose dimensions happen to be suitable, the work commences by ripping out the whole of the interior of the shell, and beginning the internal construction *de novo* from bottom to top.

They are, in all cases, constructed under guarantees to perfectly perform their work. They are now extensively used in the largest gas-works of London and the chief cities of Europe, the number in use exceeds **one hundred,** and their perfect efficiency and profit to a gas company have been fully established with every variety of coal used in Europe. References can be given to the largest gas-works in Europe.

By their use the department of purification from ammonia upon a gas-works is made complete, without the aid of prepared oxide of iron, chemicals in purifiers, or any other supplementary process, and the whole ammoniacal residual product contained in the coal is absorbed and obtained in the form most profitable to a gas company, while the requirements of all Acts of Parliament and of the Board of Trade, relating to incorporate gas companies, are satisfied.

Foul Gas, properly condensed, entering the inlet is, by once only passing through the Scrubber, completely purified from ammonia with regular certainty day by day, without any further trouble, or any other process, effected by a very small quantity of clear water let into the machinery room at the top of the Scrubber, which is discharged at the liquor outlet at the bottom, from Newcastle coal at about 18 to 20 ounces strength, from Yorkshire and other coals, generally from 25 to 30 ounces strength; while acidulated litmus or turmeric exposed at the Scrubber outlet will not show the slightest discoloration, and there is not a quarter of a grain of ammonia per 100 feet left unabsorbed.

They contain their own engine power, requiring only a small inappreciable quantity of steam from the gas-works boiler, and are then complete in themselves, ready for service.

Applications relating to dimensions and prices should be addressed to us, C. and W. Walker, 8, Finsbury Circus, London, E.C., or to Mr. William Mann, late Superintendent of the Chartered Gas-Works, Blackfriars, London; they should state approximately the largest make of gas in 24 hours on a winter's day, and the smallest make on a summer's day, to be purified.

HENRY GREENE & SON,

GAS AND HOT WATER ENGINEERS,

155, CANNON STREET, E.C.

Manufactory: 19 & 20, NICHOLAS LANE, E.C.

SUN-BURNERS,

With Regulating Valves to obviate down draught.

MEDIÆVAL & OTHER GAS-FITTINGS

For Churches and Domestic Use.

ARCHITECTS' OWN DESIGNS WORKED OUT.

ESTIMATES FREE OF CHARGE.

THE TRADE SUPPLIED.

SOLE CONSIGNEES FOR BRÖNNER'S IMPROVEMENTS IN GAS LIGHTING.

IN THE MATTER OF

BRÖNNER'S

GAS-BURNERS.

HENRY GREENE AND SON, 155, Cannon Street, London, Sole Agents for Great Britain, Ireland, and Colonies, of Brönner's Improvements in Gas Lighting, beg to inform the public that on the 13th of January, 1876, Julius Brönner obtained an injunction in the Court of Session, Scotland, against Donald M'Vean, Gas-Fitter, 14, Newton Street, Glasgow, prohibiting him from in any way advertising or offering for sale as Brönner's Burners, any Burner not manufactured by Julius Brönner, or from in any way inducing the public to believe that the said Donald M'Vean sells or keeps for sale Brönner's Burners, manufactured by Julius Brönner, while such is not the case.

Also that on the 9th of November, 1875, he obtained injunction in the same Court, and in the same terms, against R. M. Brechin and Co., 46, North Hanover Street, Edinburgh.

Also that on the 20th of April, 1875, in a suit in Chancery, before Vice-Chancellor Malins, number 1874, B 365, he obtained injunction against another defendant, in the same terms and on similar grounds.

WEST'S GAS IMPROVEMENT COMPANY,

LIMITED,

ARE NOW PREPARED TO SUPPLY AND ERECT THEIR PATENTED MACHINERY FOR

CHARGING AND DRAWING GAS-RETORTS,

And to enter into arrangements with GAS COMPANIES for its use upon moderate terms of Royalty.

The Patented Machinery has secured the approbation of all Engineers who have visited the MAIDSTONE GAS-WORKS, *where it is in full operation, and may be inspected at any time on application to the Manager.*

The advantages attending its use are—

INCREASED VOLUME OF GAS PER TON.—INCREASED YIELD PER RETORT.—INCREASED BULK OF COKE FOR SALE.—REDUCTION IN LABOUR AND LESS DEPENDENCE ON SKILLED STOKERS.

A Pamphlet containing a description of the Machinery, and Copies of Reports on the working of the same, &c., will be forwarded on application to the MANAGING DIRECTOR, Maidstone. Communications may also be addressed to the Consulting Engineer, R. P. SPICE, Esq., M. Inst. C.E., 21, Parliament Street, London, S.W., or to the Engineer and Analyst, F. W. HARTLEY, Esq., A. Inst. C.E., 55, Millbank Street, London, S.W.

MESSRS. NEWTON, CHAMBERS, & CO.,

THORNCLIFFE IRON-WORKS, NEAR SHEFFIELD,

MANUFACTURERS OF

IMPROVED CENTRE-VALVES,

PURIFIERS, CONDENSERS, SCRUBBERS, GASHOLDERS, ROOFS,

And every description of Gas Machinery.

TENDERS GIVEN FOR WORK FIXED COMPLETE IN ANY PART OF THE KINGDOM.

ALBERT GAS COAL.

THE DERBYSHIRE

SILKSTONE COAL COMPANY,

LIMITED,

CAN OFFER A

GAS COAL

Of superior quality, delivered at any station in England and Wales.

Purified gas per ton of coal in cubic feet (average)	**10,775**
Weight of coke in lbs. per ton of coal	**1,465**

ANALYSIS AND PRICES ON APPLICATION TO

Mr. EDMUND TAYLOR, Secretary,

ALBERT COLLIERY, NEWBOLD, NEAR CHESTERFIELD.

THE
SILICA FIRE-BRICK CO.,
OUGHTIBRIDGE,
Near SHEFFIELD,
Manufacturers of THE ORIGINAL SILICA OR DINAS FIRE-BRICKS. Specially adapted for Gas-Retort Furnaces, and for Siemens's Gas-Furnaces. Shipments promptly executed to London, Liverpool, Hull, Grimsby, &c.

TROTTER, HAINES, & CORBETT,
BRETTELL'S ESTATE
FIRE CLAY & BRICK WORKS,
STOURBRIDGE.
Manufacturers of GAS-RETORTS, GLASS-HOUSE FURNACE & BLAST-FURNACE BRICKS LUMPS, TILES, and every description of FIRE-BRICK.
Proprietors of
BEST GLASS-HOUSE POT and CRUCIBLE CLAYS.
Successors to
E. BAKER AND CO., LATE BRIERLEY HILL, STAFFORDSHIRE.

MOBBERLEY & PERRY,
FIRE CLAY and BRICK WORKS,
STOURBRIDGE.
Proprietors of
BEST GLASS-HOUSE POT and CRUCIBLE CLAY.
Manufacturers for Home and Export.
GAS-RETORTS, GLASS-HOUSE FURNACE,
BLAST-FURNACE, TANK BRICKS, LUMPS, TILES,
And Every Description of Best Fire-Bricks.

HARPER & MOORES,
PROPRIETORS OF THE
BEST STOURBRIDGE CLAYS,
STOURBRIDGE.
Manufacturers of all Descriptions of
BEST STOURBRIDGE FIRE-BRICKS, LUMPS,
AND CLAY RETORTS
Of all Dimensions for Gas-Works,
GLASS-HOUSE POTS & CRUCIBLES
Of every kind.
The Highest Award was obtained by H. & M., at the Philadelphia Exhibition, 1876, for Superior Quality of Manufacture.

SZERELMEY STONE LIQUID,
Which waterproofs and casehardens every kind of masonry, and
SZERELMEY IRON PAINT,
"The only permanent preservative against rust," having enjoyed the approval of the most eminent authorities, including SIR CHARLES BARRY, SIR R. I. MURCHISON, PROFESSOR FARADAY, "THE TIMES," "PALL MALL GAZETTE," "ENGINEER," "BUILDING NEWS," "IRON," &c.
MESSRS. SZERELMEY & CO.
Need only offer to send prices and particulars, and to advise correspondents how to treat special cases. Address
6, MARTIN'S LANE, CITY,
LONDON, E.C.

"SELLARS' CEMENT"
PREVENTS WASTE OF GAS FROM RETORTS;
SAVES CLAY RETORTS FROM DESTRUCTION BY FIRE;
GREATLY ECONOMIZES THE USE OF FIRE-BRICKS;
And PREVENTS ALL POSSIBLE LOSS of GAS FROM LEAKAGE.
J. C. SELLARS,
THE GAS CEMENT WORKS,
BIRKENHEAD.

GAS AND WATER PIPES.
WILLIAM MACLEOD & CO.,
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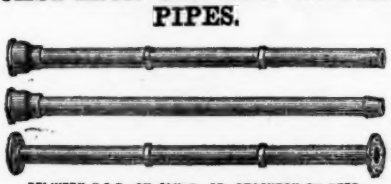
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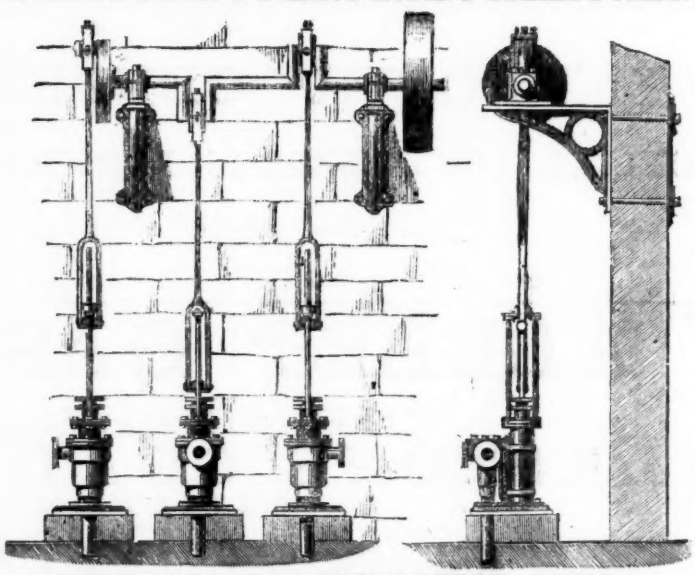
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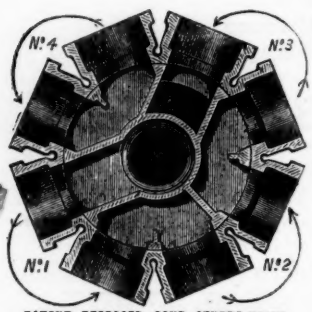

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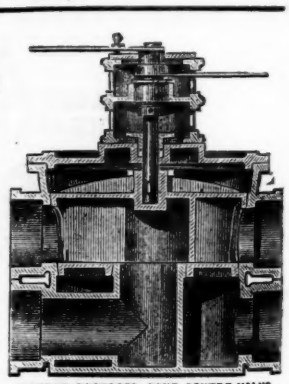

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